

**AN INVESTIGATION INTO INFORMATION LITERACY IN NURSING
PRACTICE – HOW IS IT EXPERIENCED, WHAT ARE ITS PARAMETERS,
AND HOW CAN IT BE DEVELOPED?**

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Dedicated to the memory of my beloved parents

Marie and Eric Forster

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Abstract

Information Literacy is believed to play a key role in nursing, especially in the context of Evidence-based Practice (EBP), the initiative within health and social care in which clinical practice is informed by research and other evidence in order to improve care and facilitate patient safety. However there is a need for more systematic research into the nature and parameters of that role, in order to obtain a better understanding of the contextual meanings Information Literacy has for nurses as a profession. The knowledge and evidence obtained could inform Information Literacy educational interventions which currently lack a significant evidence base.

This study applies methods based on the qualitative, second-order methodology Phenomenography to determine the range of Information Literacy experiences within the nursing profession. Nurses of various backgrounds in varying clinical and professional contexts were interviewed in depth. Insights from the findings have been used to map out the parameters of Information Literacy as experienced in nursing practice, including those of an ethical dimension not previously identified or discussed in the literature. Using these parameters as fundamental structural components, and using Variation Theory, an education theory developed from phenomenographic research, a structure and method for the first fully evidence-based Information Literacy educational intervention for nurses was put forward.

A second stage of the study went on to re-interview a number of participants after having undertaken a nursing Information Literacy course, in order to determine if it is possible to identify any increase in the range of Information Literacy experiences, using a method, though based on phenomenographic principles, that has not been previously employed. The findings were used to suggest a method that could allow such educational interventions to be audited and an individual student's progress to be described and monitored.

This is the first investigation into the Information Literacy experience of an evidence-based profession as a whole. The findings offer insights into what Information Literacy means to nurses as a profession, how it could be developed and tracked in an evidence-based way, and suggest a modification in how Information Literacy itself should be defined.

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PART 1: THE STUDY AND ITS CONTEXT

Chapter 1

Origin and Aims of the Study

1.1. The Context: Information, Information Literacy and Nursing

Information may be defined as data that has meaning (Mingers 1997; Ratzan 2004; Floridi 2010). Both Information and Data can be related to Knowledge - information regarded as 'true' in its meaning, a sufficiency of which leads to understanding (Megill 2012; Hoyt et al 2012) and what has been defined as 'Wisdom' – the ability to make critical use of knowledge to make intelligent decisions (Hoyt et al 2012) in a developmental hierarchy as shown below.



Figure 1.1.1. The Information Hierarchy (Hoyt et al 2012, p.2)

Information Literacy appears to be a critical phenomenon in the context of this Hierarchy. It is experienced by someone who can

'demonstrate an awareness of how they gather, use, manage, synthesise and create information and data in an ethical manner and ... [has] the information skills to do so effectively.' (SCONUL 2011 p.3).

And as a result *'synthesis[e] ... information and data to create new knowledge'* (SCONUL 2011, p.11).

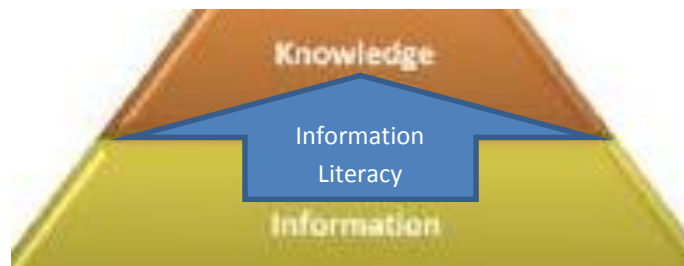


Figure 1.1.2. Information Literacy's Role in the Information Hierarchy (Hoyt et al 2012, p.2 modified)

An Information Literate person *gathers, evaluates* and *manages* all relevant information to *present* (SCONUL 2011, p.8-11) a truthful (as possible) representation of the object of interest (Knowledge), so leading to the possibility of Understanding and 'Wisdom'.

Information Literacy is believed to play a key role in Nursing, especially in the context of Evidence-based Practice (EBP), the key initiative in which clinical practice is based on research and other evidence (Shorten et al 2001; Barnard et al 2005; Bailey et al 2007; Ross 2010; Glasper 2011). Nurses must be able to gather, use, manage and synthesise research evidence and other information sources, to create from them the knowledge and wisdom required to conceptualise, develop and deliver the safest, most effective care possible (Nursing and Midwifery Council (NMC) 2010a; NMC 2010b; Hughes 2008; Pearson et al 2007; Sackett et al 1997).

In what way does an Information Literate nurse perform this role?

What does it mean to be Information Literate in Nursing?

This study is an investigation into the experience of Information Literacy in the Nursing profession. Can its structures and meanings be ascertained, and if so, how can that knowledge be applied to its effective development?

1.2. The Problem

As a librarian working with nursing students and qualified nurses, the author of this study has for some time been interested in how, why, in what contexts and to what effect, research evidence and other information sources are used by nurses as a profession. Could such knowledge lead to the formulation of more effective educational interventions to develop Information Literacy in Nursing? The University of West London's Information Literacy module 'SEARCH for Health' created by the author, has been adopted in pre- and post-registration nursing courses within the University's College of Nursing, Midwifery and Healthcare. However the module, though based on insight from extensive experience of nurses and the information sources available to them, was not developed from research evidence. The module cannot *prove* its appropriateness or effectiveness in any conclusive way, risking its place in future curricula.

What are the apparent reasons for these limitations?

- There would appear to be no comprehensive and detailed picture of what Information Literacy 'means' in practical terms for nurses, on which to map outcomes. - how, why and in what contexts nurses find and use Information to create knowledge, and what forms that knowledge takes.
- Hence there is no evidence-based guidance in what Information Literacy educational interventions should contain or aim to achieve, or any meaningful way of proving that they have a positive effect.

As this suggests, research into Information Literacy in Nursing has given little assistance. The literature overwhelmingly consists of reports of work being done by librarians attempting to develop Information skills in nurses, based on a behaviourist or constructivist understanding of Information Literacy (Wallace et al 2000; Shorten et al 2001; Brettle 2007; Brettle 2003). There is, because of the limited value of these paradigms (Bruce 1998), very little quality evidence of the effectiveness of such initiatives in terms of their value in developing Information Literacy (Garg and Turtle 2003; Brettle 2003; Stombaugh et al 2013). The literature is consistently interested in how Information Literacy is understood to manifest itself in terms of the skills and competencies felt to be associated with it (Wallace et al 2000; Brettle 2003; Bailey et al 2007; Brettle 2007; Turnbull et al 2011 and others), while saying little about how nurses actually *experience* being Information Literate: what functional meanings it has for them in the varying contexts of their practice. Research findings have sometimes consisted of no more than the recording of nurses' reflections on their levels of 'self-confidence' (Craig and Corral 2007; Turnbull et al 2011) and sense of being 'competent' in such activities as literature searching (Brettle 2007), without being able to show whether in terms of information Literacy in nursing practice, that confidence and competence are meaningful. What little research there has been into the experiences of nurses or nursing students (Toledano O'Farrill 2008; Osborn 2011) is very limited in focus.

1.3. Addressing the Problem

This appears to confirm that what Information Literacy in Nursing means in concrete terms lacks a comprehensive research-based description, and as a consequence Information Literacy education for nurses operates at a disadvantage.

How could this problem be addressed? The lack of understanding of what it means subjectively - how, why and in what contexts nurses find and use Information to create knowledge, and what forms that knowledge takes - suggested that an attempt to achieve a complete research-based understanding of nurses' experience of Information Literacy would be the correct approach. A research study which treats Information Literacy as a concept - or more precisely, an experienced concept: a phenomenon - the experience of which could be analysed for its contextual and functional meanings, was seen as potentially yielding such an understanding. A study of experiences as described by a representative sample of nurses.

Could such an understanding go on to form the basis of evidence-based Information Literacy education for nurses, education based on recognised, structured and potentially measureable aims; aims focused on the experienced meanings Information Literacy has for nurses? Could the structure and content of an evidence-based Information Literacy educational intervention be mapped out? Could methods be developed to test the value of such interventions and map the educational progress of students, now that the structure of meanings within 'Information Literacy in Nursing' was known?

1.4. The Aims of the Study

In order to address these problems and questions, this research project was developed with the following four **Aims**:

1. To investigate how being Information Literate is experienced by nurses.
2. To use the insights obtained to develop a description of the parameters of information literacy in Nursing, including those of its role and value in EBP.
3. To use the parameters of Information Literacy in Nursing to develop an outline of the structure and content of an evidence-based Information Literacy educational intervention for nurses.
4. To analyse the information literacy development process in nurses with a view to practical application and improvement of outcomes.

The Structure of the Thesis and the Fulfilment of the Study's Aims

The Thesis is structured to show clearly the way these Aims were fulfilled. Section 1 analyses the literature in more depth to provide a context for a discussion of the methodological requirements of the Aims of the study. After a Pilot Study was conducted to finalise them, The Methods are discussed in Chapter 5. Section 2 describes the Data collection and analysis methods to fulfil Aims 1 and 2. As data from Stage 1 was needed to fulfil Aim 3, it seemed logical to place the content of Chapter 9 here. Section 3 (Chapters 10-12) looks at how Aim 4 was addressed. Chapter 13 is a discussion of the significance and value of the findings of this study.

1.5. Summary

- Information Literacy appears to be critical to the transformation of Information and data into knowledge.
- It is believed to play a key role in Nursing, especially in the context of EBP.
- However, no-one up to now has produced a complete evidence-based description and interpretation of Information Literacy in the context of the nursing profession as a whole.
- This is because there appears to have been no investigation of the Information Literacy experiences of a representative sample of the profession as a whole. An investigation that would, by approaching Information Literacy as a *phenomenon*, set out the range of contextual and functional meanings that it has for nurses.
- It would appear that this lack of awareness of the parameters of Information Literacy experience within the profession has hampered Information Literacy education for nurses. Such knowledge could contribute to the development of genuinely evidence-based Information Literacy education; one based for the first time on a framework of relevant, understood and potentially measureable aims.

Chapter 2

Information Literacy and Nursing: A Review of the Literature

2.1 Introduction

This chapter will undertake a wider analysis of the concepts, definitions and research findings from the academic and professional literature discussed briefly in Chapter 1, including:

- Definitions of and approaches to Information Literacy
- Information Literacy's significance in the Nursing context
- Attempts at Information Literacy Education in Nursing

LISA, LISTA, ERIC and Academic Search Elite databases were searched for any references relevant to these three domains (Information Literacy AND (Model OR Definition); Information Literacy AND Nursing; Information Literacy AND (Education OR Training) AND Nursing). The Nursing database CINAHL was also searched extensively with positive effect. Several Information Literacy research papers were published in Nursing journals; research which didn't necessarily find its way into the Information Science literature as well. The searches were repeated every 6 months.

Studies discussed and analysed in this chapter are representative, or in some cases, original and ground-breaking. The intention is to provide a valid and comprehensible, if not pointlessly exhaustive, picture of relevant research and opinion in the areas relevant to the study, especially for the purpose of highlighting its context, and potential originality.

2.2. Information Literacy

2.2.1. Models and Definitions

Information Literacy is a broader and more complex concept than 'Information skills' or 'Information management'; it is

“The set of integrated abilities, encompassing the reflective discovery of information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning”. (ACRL, 2015)

The term 'Information Literacy' was coined by Paul Zurkowski in 1974 in a proposal to the US National Commission on Libraries and Information Science. The idea of Information Literacy evolved from more common and more restricted notions of library skills or information skills. (Rader 1991; Snaveley and Cooper 1997).

A key watershed in the acceptance of the concept was the publication of a definition of Information Literacy by the American Library Association:

‘To be information literate a person must be able to recognise when information is needed and have the ability to locate, evaluate and use effectively the needed information.’ (American Library Association 1989)

The following years saw a divergence of views between those who held to a behaviourist model (following such authors as Kuhlthau 1993) in which Information Literacy is seen as a portfolio of skills and knowledge, and those who put forward a constructivist model (following such authors as Doyle 1992) in which it is the ability to perform a 'real-world' information task.

The academic and professional literature identifies a range of definitions of Information Literacy. The SCONUL Seven Pillars of Information Literacy (Identify; Scope; Plan; Gather; Evaluate; Manage; Present (SCONUL 1999; revised 2011)), in the United Kingdom, and the American equivalent, ALA/ ACRL's Information Literacy Competency Standards (ACRL 2000 – revised 2015), stress a skills and knowledge combination which allows the information literate person to follow a 'pathway' to successfully identify, locate and critique information sources. Both frameworks are therefore behaviourist. However the 2011 revision of the SCONUL seven pillars gives the following definition of Information Literacy:

'Information literate people will demonstrate an awareness of how they gather, use, manage, synthesise and create information and data in an ethical manner and will have the information skills to do so effectively.'(SCONUL 2011 p.3)

There is now a focus on the skills needed for 'real-world' competence.

'Within each "pillar" an individual can develop from "novice" to "expert" as they progress through their learning life.'(SCONUL 2011 p.3)

Which would suggest that such definitions are now evolving towards a competency model, a blend of constructivist and behaviourist approaches.

Amongst other models, Kuhlthau's six stage model of literature analysis (Kuhlthau 1988; Emmons and Martin 2002; Kracker 2002) has had some influence. In this model

‘..rather than learn to use the online catalog and an index simply for the sake of becoming familiar with those tools, students do so in the service of a real quest for information to increase their understanding.’ (Emmons and Martin 2002, p.547).

This is an example of a model which makes use of constructivist ideas, in which there is an understanding that Information Literacy is the ability to apply skills and understanding, in a context or situation, for a specific purpose, and is not simply the ability to perform a task or exhibit abstract knowledge.

Two other models, Eisenberg and Berkowitz’ Big6 information skills (Eisenberg and Berkowitz 1990) and the similar ‘Doyle’s attributes of an information literate person’ (Doyle 1992) involve the Information Literate person knowing which information related tasks to perform and knowing how to perform them. Eisenberg and Berkowitz (1990)’s Big6 steps are defined as:

- *task definition,*
- *creating information seeking strategies,*
- *locating and accessing information,*
- *using information,*
- *synthesizing information*
- *evaluating information.*

In Doyle’s model the information literate person recognises the value of information for effective decision-making and can formulate questions, identify sources, search successfully and access and evaluate the

information found. Both models are skills / knowledge oriented but with some awareness that Information Literacy should be focused on the individual and his or her capacity to use those skills and apply the knowledge.

Information Literacy as a Competency

As briefly alluded to above in the discussion of the updated SCONUL definition (2011), in recent years a blending of behaviourist and constructivist approaches has led to definitions which present Information Literacy as a 'Competency' (Weiner 2014). A definition of the Competency type describes the necessary skills, knowledge and abilities which characterise an effective practitioner but in the context of the purpose and value of that effectiveness. This approach has been taken up by, and on behalf of, professional groups and identified constituencies believed to have their own particular information needs and behaviours. E.g. the competencies set out for nurses by the Royal College of Nursing (RCN 2011) or those for students and academics by the ACRL (ACRL 2015).

Information Literacy as a Concept

As well as the development of competency-based descriptions and definitions of Information Literacy, a quite different approach has come to significance in recent years, based on the findings of research studies grounded in the methodology Phenomenography. Bruce (1997) developed a 'relational' model for Information Literacy by treating it as a 'concept' and by implication, a phenomenon, an experienced concept, rather than a competency, in an attempt to uncover the varying roles and functions that

Information Literacy had in the lives of information users. The relational model emphasises that at any moment the information user's experience of being information literate is subjective but contextualized, and can be described by a relatively small number of archetypal formulations of 'variations' in that experience. In her study of Information Literacy as experienced in a population of Australian academics she derived 7 such archetypal descriptions of experience, or 'Categories of Description':

- 1. As a user of IT*
- 2. As knowing what information sources to use*
- 3. Knowing processes to search those sources*
- 4. Information control: having information stored and easily to hand*
- 5. Knowledge construction: building a personal knowledge base*
- 6. Knowledge extension: combining knowledge and personal perspectives to create new insights*
- 7. Wisdom: using information wisely for the benefit of others: exercising judgement, making decisions, doing research; placing the information in a wider context.*

The 'experiences' ascend in level of complexity from 1 to 7.

Does this mean each person is Information Literate in one of the seven ways – analogous to a personality type? No. Each individual can potentially experience Information Literacy in any of the seven ways, exchanging one way for another, as their perspective changes as information gathering and processing tasks vary. Although not all information users are necessarily capable of the more complex experiences.

This understanding of the subjective and contextual nature of Information Literacy goes a step beyond a model of the Kuhlthau type in its sensitivity to the many different contexts in which Information Literacy is experienced.

Although research based on behaviourist and constructivist ideas of Information Literacy continues, Bruce's use of Phenomenography to establish relational descriptions of Information Literacy experience has been taken up and applied to specific groups. Some of these will be discussed in the next section. The 'relational' approach to information Literacy is achieving ever greater influence:

'ACRL's previous definition of information literacy describes it as a set of skills or competencies that are uniform among all learners. This conception is based on an inventory of competencies assumed to operate one-dimensionally across all disciplines and contexts. Other conceptions growing out of the research of Bruce, Lupton, Lloyd, and Limburg identify the limitations of this skill- and- individual-attribute-based conception. The commonalities of these researchers' findings emphasize the highly relational, context-specific nature of information literacy, and the varied circumstances in which individuals and groups activate these competencies and describe them to researchers.' (ACRL 2014, p.4)

2.2.2 Information Literacy as a Concept: Research into How Information Literacy is 'Experienced'

Bruce's work has proven to be seminal, with the use of her methods to investigate how Information Literacy is experienced taken up by other researchers, often looking at Information Literacy in specific groups and contexts (e.g. Limberg 1999; Maybee 2006; Boon et al 2007; Williams 2007; Lupton 2008; Andretta 2010; Diehm and Lupton 2012). Studies by Toledano O'Farrill (2008) and Osborn (2011), specific to groups within the Nursing profession, will be discussed in a later section.

'These lines of research have revealed the need to distinguish the view of information literacy as a series of skills to be acquired from the view that information literacy is about effective engagement with information, when learning in different contexts.' (Bruce and Hughes, 2010, p.A2)

The fundamental aim of many of these studies was to determine through an analysis of the range of experiences of a sample of participants what Information Literacy means in practical terms, and to use this to construct more focussed educational interventions. In what form does Phenomenography yield such meanings? The archetypal experiences described by Categories of Description are often defined in terms of the knowledge types that experiencing Information Literacy generates. This insight into what a group 'achieves' through Information Literacy, and in what contexts, has the potential to allow Information Literacy education to be focused more effectively.

Lupton (2008) investigated the information seeking behaviour of first year college students in order to inform the development of an improved Information Literacy curriculum. Lupton emphasised the educational value of Categories of Description – especially the value in discovering the less sophisticated ways of experiencing a phenomenon. By understanding how individuals experience a phenomenon in a way that can apparently be matched to lower educational achievement, Lupton argued, it becomes clearer how to develop ways to get them to experience it in more successful ways.

Lupton found three Categories of Description describing the ways her students experienced Information Literacy:

- 1. Seeking of evidence to back up an existing argument;*
- 2. Seeking information to develop an argument;*
- 3. Seeking information in the process of 'learning as a social responsibility'.*

Category 1 had three sub categories: a. seeking statistics; b. seeking opinions and ideas; c. seeking contrasting perspectives. Category 1 appears to describe experiencing Information Literacy as knowledge accumulation; In Category 2 as knowledge extension. Category 3 had a wider and more sophisticated focus: the ability to use knowledge to initiate complex processes.

Lupton described learning from a 'phenomenographic perspective' as moving from a less sophisticated to a more sophisticated way of experiencing the phenomenon. He therefore recommended an educational

process which concentrated on developing in students the ability to experience Information Literacy in ways described by Category 2 and 3.

Lupton's findings can be compared to those by Maybee (2006) who also investigated the Information Literacy experiences of undergraduate students. Maybee observed three categories of description which were similar to those found by Lupton.

Category 1 – Information Literacy experienced in finding information located in various sources;

Category 2 – Information Literacy experienced in finding information to initiate a process;

Category 3 – Information Literacy experienced in finding information to build up a personal information store for future use.

Category 1 seems to match Category 1 in Lupton's study in which knowledge is accumulated. In a similar way, Category 3 can be matched to Category 2 in Lupton in which Information Literacy is experienced in the building up functional knowledge. And finally, Category 2 can be matched to Lupton's Category 3: information used to begin a process; in this case solving a problem or one involving knowledge-based decision making.

Boon et al (2007) investigated UK English literature academics' experiences of Information Literacy. What were the similarities and differences in comparison to the findings of Lupton and Maybee's studies with students? Do academics experience Information Literacy in more sophisticated ways,

with little or no 'Category 1' experience? Not necessarily....Boon et al identified the following categories:

Category 1 where Information Literacy was experienced as locating information as text;

Category 2 in which there is a focus on the location of information by means of IT. - A more systematic accumulation of information that in Category 1, based on knowledge requirements expressed as keywords.

Category 3 the experiencing Information Literacy as part of the deployment of research skills. – a development of knowledge in order to form a new perspective, or at a smaller scale 'problem-solve'.

Category 4: Information Literacy is experienced as a contribution to personal growth and development and the acquisition of higher order information skills in order to become confident autonomous learners and critical thinkers.

Category 4 goes beyond the 'problem-solving' of Category 3 to the more sophisticated experience of a type of individual who will have absorbed Information Literacy into an attitude and instinctive approach to work and life in general. A fully developed 'wisdom' category?

Categories 1 and 2 appear not to be focused on contextual knowledge accumulation. Section 13.5. discusses how these basic, function-focused 'information gathering' Categories can be redefined as only partial and incomplete Categories of Description.

Williams (2007) looked into conceptions (different meanings derived from contextual experiences) of Information Literacy of secondary school teachers, in the context of Information-based interactions with their students. She found the following six Categories of Description.

- *Finding information*– which emphasises the ability to obtain simple knowledge by navigating the sources
- *Linguistic understanding*– which involves comprehension of the significance of new information and how it adds to existing knowledge.
- *Making meaning* – deriving meaning from information within the context of the specific subject under consideration.
- *Skills*– applying information from many sources to make meaning and evaluating and reflecting on decisions.
- *Critical awareness of sources*– evaluating the quality and validity of Information.
- *Independent learning* – the ability to select and apply relevant skills and strategies for current purpose in and in a variety of situations, in order to learning independently.

Although skills are highlighted, it can be seen that Information Literacy experiences are always about adding to knowledge and meaning in specific contexts.

Limberg (1999) applied Phenomenography to the investigation of the information Literacy experiences of students at a Swedish University. Her findings contrasted a less sophisticated experience of Information Literacy in which knowledge development was in the form of 'fact-finding' with a more

sophisticated one which compared and synthesised information and information sources. She mapped this to surface- and deep-learning in the students; the latter involving a deeper engagement with the learning material and a desire to contribute their own opinion. The latter could be described as a form of 'knowledge-based decision making' or of 'Wisdom' as described above.

The relationship between more sophisticated experiences of Information Literacy and more advanced learning skills was also suggested in a PhD thesis by Andretta (2010) who used a phenomenographic method to look at how Information Literacy was experienced by post-graduate information management students. The categories of description found ranged in sophistication from 'everyday information goals' to the complex open-ended information goals of the life-long learner. The most complex experience, described in the 'Education' category, involved the students being able to take on the role of an educator (the purpose of their own educational experiences), fostering the development of independent learners by exposing them to open-ended, complex information goals.

Diehm and Lupton (2012) used Phenomenography to investigate experiences of '*learning information literacy*' (Diehm and Lupton 2012, p.218). The latter was defined as the process of learning the roles information and Information Literacy have in learning experiences. The experience of which could be seen to vary in terms of the complexity of the knowledge, and ability to use knowledge, it generated.

The six Categories of Description were:

- 1. Learning to find information*
- 2. Learning a process to use information*
- 3. Learning to use information to create a product*
- 4. Learning to use information to build a personal knowledge base*
- 5. Learning to use information to advance disciplinary knowledge*
- 6. Learning to use information to grow as a person and to contribute to others*

Again, the least sophisticated Categories seemed to be process focused, the latter (3-5) on knowledge generation for specific learning goals and the sixth category could be defined as a 'wisdom' category.

These studies and others like them can be summarised as producing Categories of Description of three types:

- 1. 'Process' categories in which the experience is focused on Information skills and competence*
- 2. 'Knowledge' categories in which the experience is clearly marked as developing knowledge. Knowledge of something, for a particular purpose.*
- 3. 'Wisdom' categories, in which knowledge is developed to enable effective decision-making, teaching or similar 'knowledge-backed' creative activities.*

The significance of these categories will be discussed further in Section 13.5. As stated above, the case for the ‘incomplete’ nature of the first type will be made and put in context.

‘Informed Learning’

In recent years the awareness of Information Literacy as inherently focused on contextual knowledge generation, and its corresponding role and significance within education, has led to the development by Bruce and her colleagues of the concept of ‘Informed learning’ (Bruce and Hughes 2010; Bruce et al 2012) in which Information Literacy’s role within learning is described and made explicit. Informed Learning is based on the belief, derived from *‘a program of research which has illuminated the experience of using information to learn in many contexts’* (Bruce and Hughes 2010, p.A3), that Information Literacy and Learning are almost one in the same.

Information Literacy is something experienced in, and transferable to, a range of contexts and settings, and is fundamental to the learning process as a ‘transformative’ generator of knowledge (Bruce et al 2014a). Information Literacy is *‘effective use of information for learning, rather than the acquisition of information skills’* (Bruce and Hughes 2010, p.A3)

2.3. Information Literacy and Nursing

2.3.1 The Context: Origins and Background of Evidence-based Practice (EBP) in Nursing

Nurses in their day to day practice make choices which effect how a patient is cared for and whether that care is effective, and are obliged ethically to make sure that care is the best possible (NMC 2010a). Research has been conducted into nursing care, and the research evidence produced is intended to inform nurses of the best ways to care for patients (Hughes 2008). Basing clinical practice on such evidence is termed 'EBP'.

EBP has been defined as

'The conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients.' (Sackett et al.1997, p. 2).

The commitment to EBP in Nursing has grown and become formalised: The Nursing and Midwifery Council in the UK (NMC 2010a) have indicated that nurses must deliver care based on best evidence. In 2010 the Council published their Standards for pre-registration nursing education (NMC 2010b); Competency 9 of Domain 1 states: *'all nurses must appreciate the value of evidence in practice, be able to understand and appraise research.....'* (p.14). Domain 3 states: *'all practice should be informed by the best available evidence and comply with local and national guidelines.'* (p.17). It is now widely held that whatever a nurse's role or position, she or he must be able to access and assess evidence and apply it in practice (Pearson et al 2007)

One distinction between EBP in Nursing and its equivalent in Medicine is the former's openness to a wide range of 'evidence' including that from qualitative research. Information Literacy in Nursing is a more complex and wide-ranging activity than the comparison of quantitative statistical data (Jacobs et al 2003). Evidence may be primarily from research, but may include information from and about patients or from colleagues. For Craig and Stevens

'An evidence-based approach entails the integration of research evidence, clinical expertise and the interpretation of patients' needs and perspectives in making decisions.' (Craig and Stevens 2012, p.3)

This multiple sourcing of 'evidence' suggests an investigation into Information Literacy in Nursing would need to concentrate on all forms of 'evidence' collection, not just from research studies.

2.3.2. The Role of Information Literacy in Nursing

As described above, Nurses are expected to base their practice on various sources of evidence and it is widely held that information literacy is a key component in this process (Bailey et al, 2007; Ross 2010; Pravikoff et al 2005; Bernath and Jenkin 2006)

In an investigation into Information Literacy in Nursing, Pravikoff et al (2005) summarised the practical steps involved in EBP, which involves a nurse in:

- *assessing and defining a problem and formulating a specific question.*
- *searching for, finding, and evaluating appropriate evidence.*

- *planning and implementing an intervention by integrating the evidence into practice.*
- *evaluating the process and the results.* (Pravikoff et al 2005, p.41)

They assert that Information Literacy is essential in the performance of these steps.

It could be hypothesised, therefore, that without the ability to identify, locate and interpret evidence of all kinds, EBP cannot function and so Nursing practice risks becoming out of date, inappropriate or even dangerous.

Bailey et al (2007) emphasised that it is essential for students training to enter health professions to become Information Literate as

'The drive towards EBP and care makes it essential that students become information literate and acquire the skills to become lifelong learners.'

(Bailey et al 2007, p.78)

For Barnard (2005) the development of Information Literacy is the foundation for critical thinking in nursing, and necessary for the successful implementation of evidence-based approaches to clinical practice. In fact, the application of new clinical evidence is vital in developing and retaining competence throughout a nurse's career.

'Development of information literacy not only facilitates engagement with effective decision making, problem solving, and research, it also enables nurses to take responsibility for continued learning in areas of personal or professional interest.' (Barnard 2005, p.506).

The role of Information Literacy in learning (Bruce and Hughes 2010) has been discussed above.

Despite this, nurses and nursing students often lack the skills to locate and evaluate information on which to base clinical decisions (Dee and Stanley 2005; Jacobs et al 2003; Pravikoff, 2005; 2006; Verhey 1999). Majid et al (2011) found that nurses thought EBP a valuable concept, but because of a lack of time, inability to understand statistical terms, and inadequate understanding of research terminology, were unable to find and use evidence. Layton (1995) pointed out that nurses have historically made less use of libraries than comparable health professionals and that this was usually ascribed to them having little and knowledge of, and few skills in information use. Medical schools often had for credit modules in finding research literature and other Information Literacy -based topics but this was rare in nursing education.

Ross (2010) in an investigation of Peri-anaesthesia nurses' literature searching skills concluded:

'A barrier to EBP has been identified as a need for improved information literacy and includes recognition of information required and the development of skills for locating, evaluating, and effectively using relevant evidence'. (Ross 2010, p.64)

Beke-Harrigan (2008) conducted an investigation of the EBP readiness of a large group of nurses and found that though they accepted that research evidence was increasingly important to their practice, many admitted to not using their in-house library, not knowing how to use specialist databases,

preferring Google. As Beke-Harriagan states, many nurses provide care based on what they learned in nursing school and on their accumulated experiences and neglect other sources of evidence.

Does this apparent failure to acknowledge Information Literacy's significance inhibit EBP? According to Alan Glasper, Professor of Children's Nursing at the University of Southampton:

'The rhetoric of EBP fails to recognize that it is the ability to source and process information—in other words, 'information literacy'—which is the key to EBP. It is important to stress that it is the ability of the nurse to pose a precise and answerable patient-focused question that will facilitate a more efficient search of the literature and eventual retrieval of documents which can be interrogated through critical appraisal.' (Glasper 2011 p.188).

Could this situation be improved with Information Literacy education focused on a nurse's actual clinical experiences? It could be hypothesised that such education is more likely to find a valued place in professional training and nurse education if it can be shown, as it cannot as present, to be based on such experiences. Information Literacy education based on research evidence showing a significant role in EBP, and therefore in improving practice and patient safety, could become fundamental to training and education for that very reason.

2.3.3. Information Literacy in Nursing Defined as a Competency

The SCONUL seven pillars have been adapted into 'lenses' which describe the skills and knowledge required to perform certain roles, and can therefore be said to be a range of 'competencies'. Dalton (2013) described such a lens developed for evidence-based health professionals. Each of the 7 Pillars is interpreted in a way meaningful for the health professional. For example, the first pillar, *Identify* involves *understanding for example: the elements and construction of a focused clinical question and being able to amongst other things, recognise when information can meet a specific clinical or patient need.*

In October 2013 the Association of College and Research Libraries (ACRL) produced their 'Information Literacy Competency Standards for Nursing' (ACRL 2013). One of its acknowledged sources was the Royal College of Nursing (RCN)'s own *Nursing, midwifery, health and social care information literacy competencies* (RCN 2011) published 2 years earlier. The RCN's competencies were developed as

'The drive for EBP within health care... is dependent on staff being able to handle information effectively, by maintaining standards in their own practice, and by supporting the informed patient.' (RCN 2011, p.2).

This kind of explicit statement from an influential body such as the Royal College of Nursing indicates Information Literacy's value in EBP has become increasingly understood.

The competencies were developed through questionnaires sent to a mixture of librarians and nurses. The 'headline' information literacy competences arrived at are:

- 1. identifying why information is needed*
- 2. identifying what information is needed*
- 3. carrying out a search to find information*
- 4. evaluating how the information meets the identified need*
- 5. using information and knowledge inclusively, legally and ethically*
- 6. managing information*
- 7. creating new information or knowledge*

(RCN 2011, p.3)

which are very close to the SCONUL definition (SCONUL 2011) which also has 7 competencies or 'pillars'. They also focus on the processes (1,2,3,4) which lead to the development of knowledge (5) and wisdom (6,7).

As described above, the 'Competency' approach is a blending of behaviourist and constructivist approaches to Information Literacy. The skills and knowledge described in these brief definitions of the competencies are grounded in the context of their use and the nature and significance of their effective application by and for the competent nursing practitioner in the development of the necessary knowledge and 'wisdom' for clinical evidence-based, and effective, clinical practice. However like other models, the SCONUL lens and other competency frameworks (while very valuable) aren't based on research into 'experience' of Information Literacy.

In the United States, before the ACRL competencies were developed, The Informatics Competencies Collaborative (TICC) (created by the TIGER initiative, a joint project of the American Nurses Association (ANA), the

American Association of Colleges of Nursing (AACN) and the Alliance for Nursing Informatics (ANI)) had recommended that nurses should be required to achieve five information literacy competency components (Cheeseman 2013):

- 1. Determine the nature and extent of the information needed.*
- 2. Access needed information effectively and efficiently.*
- 3. Evaluate information and its sources critically and incorporate selected information into one's knowledge base and value system.*
- 4. Individually or as a member of a group, use information effectively to accomplish a specific purpose.*
- 5. Evaluate outcomes of the use of information.*

(Technology Informatics Guiding Education Reform 2009)

As with the SCONUL EBP lens and the RCN competencies, the focus is on the processes (1 and 2) which initiate the development of relevant knowledge (3) and Wisdom (4 and 5) to perform the role described. What is the subjective experience of the actions given an objective, generic description here? The current study attempted to find out.

2.3.4. Information Literacy in Nursing Defined as a Concept. The 'Experience' of Information Literacy in Nursing

As shown above, it has been widely assumed that Information Literacy in Nursing is describable by a range of 'competencies' (ACRL 2013; RCN 2011; Belcik 2011) - that is, this is what a nurse knows and can do when information literate in the context of clinical practice. What is the subjective experience of the processes initiating knowledge and wisdom so described? The competencies were defined by consultation between experts (e.g.

nursing librarians and nurse educators). Research evidence has been of little help as there has been little published on how, why and in what contexts nurses search for information when at work (Younger 2010). In general terms, the research into information literacy in nursing has described it in terms of a pattern of skills and knowledge (Brettle and Raynor 2012; Ya-Lie Ku et al 2007; Rosenfeld 2002; Shorten et al 2001; Wallace et al 2000; Wallace et al 1999); or has identified it as a frequent use of information sources and resources (Wahoush and Banfield 2014).

There appears to have been no study which investigates the representative experience of Information Literacy of nurses as a profession.

However there have been some attempts to investigate how Information Literacy is experienced, or at least understood, in the Nursing field, although with a restricted focus.

Osborn (2011) applied Phenomenography to an investigation of how pre-registration nursing students understood the concept of Information Literacy and how that understanding was affected by exposure to the realities of nursing practice. He also looked into the perceived value of their Information Literacy training at the University. Osborn found that nursing students still had quite basic understandings of what Information Literacy was; their conceptions of it included: a form of IT competency; a way of using books, journals and the Internet to locate information to for university and at work; an ability to assess information quality; a part of the learning process; an ability to find what they needed to know; a sense of confidence in using libraries; a part of professional development. The students were not convinced of its significance for nursing practice, especially as they didn't

seem to notice much of it in their clinical placements. Students indicated that their information skills and confidence increased through the course, though as in other work, what the 'skills' and 'confidence' consisted of was not clear; nor what students were basing their analysis of the 'success' of Information Literacy training on.

Osborn used Phenomenography to map understandings in an explicit way, not through experience, which for student nurses was very limited. In Chapter 3 it will be argued that this is not how Phenomenography is properly used: an analysis of how an individual understands a concept should come from their experience not self-reporting definition.

Toledano O'Farrill (2008) applied Phenomenography to the analysis of 'effective information use' by nurses in the context of the group dynamic within a tele-health service provided by NHS Scotland. This rather limited idea of Information Literacy was analysed in the light of what he identified as failure of Information Literacy frameworks, such as that of SCONUL, to address *exchanges* of knowledge and information within a team in the work environment. The expression 'social sense making' is used to describe the mutuality of the process of Information Use in a working environment: a social constructivist dimension to Information Literacy.

The Categories of Description in the Outcome space (described as the 'overall picture of experience of the phenomenon') labelled 'Seven conceptions of effectiveness' were:

- *managing performance*
- *support and effectiveness*

- *development of the knowledge and skills base*
- *appropriate processes*
- *appropriate decision making*
- *appropriate communication*
- *appropriate outcomes*

Can Phenomenography be applied to determine group experience? The discussion of the epistemological basis of the methodology in Chapter 3 suggests not. However it may be possible to determine the experience of an individual working in a group: The findings of Stage 1 of the present study as described in Chapter 8, show that this is indeed an aspect of Information Literacy experience of nurses as a whole.

Is Phenomenography an effective method for investigating Information Literacy in Nursing? Fourie's (2009) work on the relevance of emotion in the 'information behaviour' of health professionals suggests it would be particularly appropriate. In Fourie's review of the literature, the following themes emerged: the significance of *emotional* responses in health professionals to the difficulty in identifying information needs; the importance of understanding their processes and motives behind sense-making and filling the gaps in knowledge; the significance of levels of anxiety and self-confidence; and the significance of emotional motivations for information seeking itself. Fourie found that these emotional motivations and issues can be derived from the health practitioner's desire to provide the best possible care and treatment in order to decrease discomfort and suffering.

‘Healthcare professionals may...be driven by affective issues to seek information such as deeply caring for patients, trying to bring comfort to patients or to sooth their anxiety.’ (Fourie 2009, p.178)

Related anxieties from the need to be ethically and professionally competent also arise.

This gives further support to the proposition that research into how Information Literacy is ‘experienced’, and in the fullest sense, in the context of emotional, ethical and professional factors, would provide a fuller and truer picture of how information is sought, assessed and used by individuals operating in a health care environment.

2.3.5. Information Literacy Education in Nursing

As discussed in Chapter 1, one of the origins of the current study was an awareness of the lack of research evidence of how Information Literacy is experienced by Nurses as a profession, and the implications for Information Literacy education.

What is the current status, value and understanding of Information Literacy education in Nursing?

As the Royal College of Nursing point out:

‘The need for nursing staff to have access to support and skills development in relation to finding, managing, evaluating and applying information and evidence is supported by the Standards for pre-registration nursing education.’ (RCN 2011, p.3)

However, students in pre and post-qualification professional courses in Higher Education including those in Nursing, often never develop information skills due to the frequently limited and patchy nature of the training they receive (Schutt 2009). Information literacy has yet to find an accepted place in the heart of nurse education and training.

Attempts have been made to rectify this situation through the development of formal educational structures such as workshop programmes attached or integrated into curricula, and credited stand-alone modules (Wallace et al 1999; Jacobs et al, 2003; Craig and Corrall, 2007; Bailey et al, 2007; Forster 2009). These have arisen through individual initiative, often in conjunction with academic staff (Stombaugh et al 2013; Leasure et al 2009; Durando and Oakley 2005) to address local needs. The literature lacks any clear evidence on which initiative is the more successful or why, or what a model of an effective programme would look like.

Reports of research into the value of Information Literacy education in Nursing are numerous. Most studies appear to have little interest in methodology and issues of validity and reliability, and conclusions are ungeneralised and vague (Brett 2003). Brett (2003) attempted a systematic review of papers describing information skills training in medical and nursing education in the UK, USA and elsewhere: its effectiveness, what the best methods in conducting it are, and whether it can be proven to effect patient care. The findings were inconclusive with 'limited' evidence produced and with many studies found to be flawed. The educational interventions varied widely: single user, small and large groups; 1 to 3 hour sessions; single and multiple sessions. Outcomes were measured mainly by

user questionnaires and self-assessment of changes in skill level; objective testing was used only in some of the programmes. Brettle points out the inadequacy of a purely subjective questionnaire as a reliable measure, citing studies in which users frequently under-report their skills levels compared to objective measurement.

Study flaws frequently included inadequate samples and inappropriate outcome measures. Typical published papers had little understanding of methodology or interest in education theory. Despite this, Brettle was willing to state that users clearly value skills training and that there are some indications that it is effective.

Even Individual studies with more rigorous methods usually begin with the assumption that Information Literacy in Nurses is associated directly with effective 'search skills' applied to certain databases of journal references, or catalogues, without evidence that this is the case. Brettle and Raynor's (2013) randomised controlled trial comparing effectiveness of online information literacy tutorials with face-to-face information skills sessions measured quality of keyword selection, boolean operators, truncation and synonyms, scoring search histories using a validated checklist. Are these key to 'Information Literacy'? The paper's title is 'To compare the effectiveness of an online information literacy tutorial with a face-to-face session for teaching information literacy skills to nurses' indicates that this is the assumption. This may well be the case, but without an evidence-based picture of how Information Literacy is experienced by nurses, it is the assertion of this thesis that it remains only an assertion, if a widely held one.

Similarly, Bailey et al (2007) analysed the effectiveness of 'remedial workshops' in using the book catalogue and 'journal portal' given to nursing students at Northumbria University. Students were identified as 'having low information literacy', and therefore suitable for the workshops, by means of a diagnostic essay which also assessed skills levels in academic writing. The study showed that skills levels and confidence were both increased by the workshops.

'Quantitative evidence, in the form of a comparison of assignment grades from the first diagnostic essay and subsequent summative essay revealed that all of the original 23 participants who attended at least one workshop improved their academic grades.' (Bailey et al 2007, p.83)

Again there is an assumption that the behaviourist Information Literacy paradigm is the correct one.

Turnbull et al (2011) assessed an on-line Information Literacy 'tutorial' for nurses, structured in the form of six modules which was intended to provide 'structured guidance' in information skills:

- 1. locating relevant resources;*
- 2. search strategies;*
- 3. evaluation;*
- 4. referencing conventions and avoiding plagiarism;*
- 5. best practice examples;*
- 6. a 'test your own skills' module to promote revision and practice.*

(Turnbull et al 2011, p.125)

Assessment was 'focussed on application' so that the practical value of the skills being developed was clear to the student. 83% of students surveyed (from a small sample) agreed that they felt more confident in using the resources. External assessment was looked for in students' grades which were '*better than last year*' (Turnbull et al 2011, p.127) – a form of measurement lacking in objectivity and precision. There was no real discussion of EBP in the paper and therefore no assessment of the value of the self-assessed increase in confidence of the students. Nor was it shown how completion of the module affected how nurses find, use and apply information in practice.

In a recent paper, Stombaugh et al (2013) described an attempt to develop an effective Information Literacy programme for nursing students using the 'Lesson Study' method. This uses observation of 'lessons' by several members of the academic team to establish whether they are achieving the academic goals set out in the course, and if not, what could be done. Stombaugh et al. indicate that the 'goals' are purely functional; students

'will be able to retrieve various levels of scholarly information and evaluate its usefulness to clinical practice, demonstrating development of skill in EBP.' (Stombaugh et al 2013, p.175)

What is the evidence that being able to demonstrate effective search strategies in CINAHL and successful demonstration of the PICO method of finding appropriate search terms, and knowing the basics of how to critique a

paper, amounts to Information Literacy in clinical practice? What is the evidence that this demonstrates 'skill in EBP'?

More recent literature indicates that most Information Literacy education still makes assumptions about what Information Literacy is for Nurses and what skills and knowledge they need. As Stombaugh et al, in a paper published as recently as 2013, state, there is still little research of value published on Information Literacy education.

Bruce (1997) identified three approaches to Information Literacy education based on the three models of Information Literacy discussed above. A behaviourist model in which an Information literate person was entirely defined as someone who exhibits certain skills and knowledge; a constructivist model in which experiences similar to those likely to be encountered in the 'real world' were simulated to lead the individual to develop a modified mental framework for dealing with information need generated within future similar experiences; and a relational approach in which Information Literacy education is based on the belief that Information Literacy is experienced in a limited number of distinct ways in different contexts. In the latter case, the individual is educated into being able to experience all of these ways and into understanding their relevance to particular contexts. The Relational approach has been shown to be effective (Catts 2005; Setoguchi 2006)

'This analysis has demonstrated the trustworthiness of the relational model of information literacy proposed by Bruce... the [relational] model

[can] be used to guide understanding and development of information literacy, (Catts 2005, p.24).

Mokhtar (2008) noted that knowledge of such theories and the various learning styles of students is important in conducting effective Information Literacy education, though discussion of these issues is largely absent from the Information Literacy literature.

Constructivism, or active learning, is widely mentioned as appropriate for information literacy 'training' (Reynolds 2001). The key aspects of constructivist based Information Literacy education, in which 'scenarios' are used to mimic real-life contexts and potential applications of information are seen as a good fit for a competency (if it is to be looked at as a competency) which has ultimate value only in the context of 'real-life' situations. Courey et al (2006) emphasises that health Information Literacy education, in particular, should be collaborative, interactive and student-focused. However, Brettle (2007) found that the most common teaching styles were hands-on practical session and 'lectures', some making use of both.

Wyss (2005) showed how Experiential and Transformational Learning theories can be applied in Information Literacy education in such a way that students can learn how to find relevant research evidence to apply to practice, if learning experiences have been constructed in which relevant scenarios are studied and analysed. Gardner's Multiple-Intelligences theory (Gardner 1983; Brewer 2005; Mokhtar 2008) proposes that there are different, but categorizable ways in which people can view the world; ways that bring with them a set of skills which allow a person to make sense of

their experiences and environment. The ways include mathematical, linguistic, special, interpersonal, and intrapersonal methods which can be taken into account when developing learning methods in information literacy education. Both Brewer and Mokhtar describe how the theory can be adapted to Information Literacy training. There is a close similarity here to Bruce's Relational Framework for Information Literacy education (Bruce 1997; Bruce et al 2006) Bruce has described her framework as positing that:

'Learning is about changes in conception – teachers need to assist students in developing new and more complex ways of experiencing information literacy. Learning always has a content as well as a process – students need to learn about discipline content as they seek and use information. Learning is about relations between the learner and the subject matter – the focus is not on the student or the teacher or the information, but on the relation between these elements. Improving learning is about understanding the learner's perspective – teachers need to understand the variation in students' conceptions of information literacy.' (Bruce 2006, p.6)

Bruce has identified six frames for Information Literacy education (Bruce 2002; Bruce et al 2006) which are based on different ways students experience learning, and in which teaching and learning can be made to occur. Bruce has identified the 'Relational frame' as being one which recognises that the ways of understanding Information Literacy the other 5 frames are based on may be adopted individually or simultaneously by one person in different contexts:

Information literacy is not a set of skills, competencies and characteristics. It is a complex of different ways of interacting with information which might also include:

- *knowledge about the world of information (content frame)*
- *a set of competencies or skills (competency frame)*
- *a way of learning (learning to learn frame)*
- *contextual and situated social practices (personal relevance frame)*
- *power relationships in society and social responsibility (social impact frame).*

(Bruce 2006, p.6)

Education based on the relational frame makes use of Variation theory which proposes that learning occurs when variation in ways of understanding or experiencing are discerned. As Bruce indicates (Bruce 1997; Bruce et al 2006) this takes the constructivist paradigm a step further. Rather than positing that there are a number of 'real-life' contexts in which skills and knowledge are applied, it ascribes a greater complexity to lived reality, in which many different ways of experiencing Information Literacy may be employed. Chapter 9 will describe how Variation Theory can be applied to the findings of the current study.

Trying to Measure the Effectiveness of Information Literacy Education

Is Information Literacy education in Nursing effective? How is effectiveness measured, and what are the assumptions about Information Literacy in Nursing behind measurement methods? For Stevenson (2012)

‘There is no consistency in the quality or methodology of information literacy training evaluation activities, with a multitude of approaches and methods being used.’ (Stevenson 2012, p.81)

There are many papers as well as systematic reviews (e.g. Williams 2002; Brettle 2007; Walsh 2009) that have addressed Information Literacy assessment. A large percentage of reported methods from these papers are based on a behaviourist paradigm and discuss the testing of various categories of Information knowledge and skills, but without providing evidence that Information Literacy is actually being measured. Many papers such as Wallace et al (1999); Wallace et al (2000); Shorten et al(2001); Rosenfeld (2002) and Ya-Lie Ku et al (2007) describe the testing of the effectiveness of Information Literacy programmes or training sessions for Nurses in increasing (self-reported) confidence in journal database searching and locating of research papers, and although positive outcomes are reported, can’t provide any solid objective evidence that the ‘successful’ ‘skilful’ or ‘confident’ student that their interventions produce, is actually Information Literate in ways meaningful to a practising nurse.

In a recent review of evaluation methods employed in Information Literacy ‘training’ provided by NHS health libraries, Stevenson (2012) identified the

Kirkpatrick Model, or modifications of it, as the most common. This employs four levels of evaluation:

1. *Learner reaction.*
2. *Modification of learner attitudes & perceptions, and learner acquisition of knowledge & skills.*
3. *Changes in learner behaviour.*
4. *Benefits to the organisation/patient resulting from learner performance.*

Stevenson criticises the model for its failure to take environmental limitations on behaviour into consideration and the analysis of behaviour in a non-work based way. In other words, a failure of interest in the experience of the student as a practising professional - even with a difficult to quantify focus on outcomes.

Similarly, in a systematic review which addressed Informatics competency and development within the US nursing population workforce (Informatics identified as including technological competence as well as information literacy) Hart (2008) believed a lack of clearly defined Information Literacy job-based competencies meant that tools for evaluating relevant skills or abilities believed to be associated with them were likely to be flawed; there is an '*absence of standardized guidelines for development of tools to evaluate informatics competency in a clinical setting*' (Hart 2008, p.328. My emphasis).

Defined competencies in Information Literacy in Nursing have been developed since 2008, but even if one retains the 'competency' paradigm for Information Literacy, the fact that they have not been based on research into

the actual experiences of Information Literacy by nurses in clinical practice, and (perhaps because of this) are quite generic e.g. *Gain access to needed information effectively and efficiently*. (Technology Informatics Guiding Education Reform 2009) *Carrying out a search to find information* (RCN 2011), suggests they are unlikely to fulfil Hart's criteria for validity.

Brettle (2007) undertook a systematic review of the validity of measurement tools used in information literacy training for health professionals. Previous reviews, including the Brettle's own, had shown that there is '*a lack of validated measures with which to evaluate information skills training*' (Brettle 2007, p.18). The assumption in all of these studies was that skills and knowledge were being measured and that the skills and knowledge in question added up to 'Information Literacy'.

Brettle found that the value of objective testing compared to 'assessment form' subjective testing was frequently ignored, and the necessity of making use of learning outcomes –knowledge and skills that can be measured and their acquirement proven or otherwise was little practiced. Validity was not addressed by most of the studies:

'The majority (n= 42, 78%) of measures described in the studies included in the review were developed for the purpose of that particular study and their validity was either not described or tested In those studies that did measure validity, face and content validity were the most common elements to be tested. In six papers, validity was discussed, but not tested or proven. The majority of studies (n= 46, 85%) did not discuss or test reliability. Where reliability was tested, inter-rater reliability was the most

common element to be established (n = 5) or internal consistency (n = 4).'
(Brettle 2007, p.24-25)

The most commonly addressed 'skill' of the 54 studies included in the review was database searching. The closely related skills of search 'question formulation' and 'selection of information sources' were the next most common. The most frequently used tool to assess the quality of searches was the search score/ scale or checklist. A literature search was assessed for features of a search e.g. were Boolean operators and/ or subject headings used.

Multiple Choice Tests were used to measure 'skills' in several studies. However, Multiple Choice Tests and surveys were more commonly used for assessing knowledge rather than skills. An alternative method to the search score/ scale or checklist, was the 'gold standard' – comparison to a model literature search on a particular topic. Other studies discussed the use of 'scenarios' such as used in enquiry-based learning – development of a literature search from a clinical problem.

In a discussion of those measures which had been tested for validity and reliability, Brettle notes that discussed by Johnston et al (2003): a questionnaire which aims to measure

'knowledge, attitude, practice, use of and anticipated future use of EBP in order to evaluate EBP teaching in an undergraduate medical setting....[the questions having the form of a]... Likert scale, open-ended and multiple choice questions and demonstrates face, content, criterion and construct validity.' (Brettle 2007, p.25).

Bradley's questionnaire from a 2007 study was intended to

'measure knowledge about searching for and critically appraising scientific articles for EBP.' (Brettle 2007, p.25).

However the latter had validity but not confirmed reliability. Brettle cites Robson (2002) to the effect that lack of confirmed reliability calls validity into question.

In another literature review of the range of Information Literacy assessment methods, Walsh (2009) listed the following in order of frequency of use:

- *Multiple choice questionnaire*
- *Analysis of bibliographies (using rubrics)*
- *Quiz/Test Self-assessment*
- *Portfolios of evidence*
- *Essays*
- *Observation*
- *Simulation*
- *Final Grades*

Some of these have a constructivist paradigm: e.g. Simulation. However the frequency of constructivist assessment was found to be less than that with a behaviourist skills and knowledge focus. Assessment tended to focus on whether a task could be performed or whether a fact was known rather than whether a participant could show that she or he knew how to solve a problem or task they may come across as part of their 'real world' existence.

The confusion and lack of rigour in assessment methods is clear. Could this be due to the lack of any clear idea of what Information Literacy in Nursing actually is? The assessment of Information Literacy in Nursing is limited due to its fundamental inability to show what it is attempting to measure. The lack of understanding of how it is experienced means that it is reduced to measuring skills and knowledge felt to be associated with it, while lacking a grasp of the way in which the skills and knowledge are/should be applied.

2.4. Summary

The review of the literature set out above can be summarised as follows:

- Information Literacy can be looked at in several paradigmatic ways, including Behaviourist; Constructivist; Competency-based and Relational. The latter is interested in the experience of information literacy, which is often described in the form of the contextual knowledge that it generates.
- Nursing is evidence-based and is therefore reliant of Information Literacy in its work-force.
- It remains unknown how Information Literacy is experienced by nurses as a profession.
- We know what skills and knowledge form part of Information Literacy education for nurses but we cannot prove that such education has validity.

Having looked at the issues which form the basis of the study in detail we will now look at the structure and content of the study. Chapter 3 looks at the Methodological options available to address the Aims of the study. Chapter 4 describes a Pilot Study which practiced and tested data collection and assessment methods suggested by the methodology chosen. Chapter 5 gives a summary description of the methods employed in the study based on its Aims, on the methodology selected to fulfil those Aims and on the findings of the Pilot Study.

Chapter 3

Methodology

3.1. Introduction

This chapter analyses the study's Aims in order to determine an appropriate methodology to address them. Required characteristics of the methodology are compared to the strengths and weaknesses of a number of approaches. The methodology selected is analysed in some depth to determine appropriate methods to be employed and which of these need to be assessed in a Pilot Study.

3.2. Finding an Appropriate Methodology

3.2.1. Addressing Aims 1 and 2

Aims 1 and 2 of the study are:

1. *To investigate how being Information Literate is experienced by nurses.*
2. To use the insights obtained to develop a description of the parameters of information literacy in Nursing, including those of its role and value in EBP.

What characteristics of a methodology are required to be able address these Aims?

Information Literacy's 'Non-Dualist' Nature

EBP in nursing can be seen as a constructivist process. Constructivism is the theory that knowledge and meaning is generated from interactions between an individual's experiences and their pre-existing ideas and understandings (Laroche et al 1998). The nurse 'experiences' a patient in a clinical setting. Part of that experience can include the development of an awareness of a need for information – the need for research and other information to develop a more effective understanding of the patient and the clinical problem. This leads to the identification, locating and critiquing of that information, often in the form of research evidence. This part of 'experience' and 'interaction' with the patient and clinical setting is the experience of

Information Literacy. This contributes to a new understanding of the patient and clinical practice in general.

Information Literacy, therefore, can form a key part of interaction with the clinical environment, but Constructivism is inadequate to describe a nurse's experience of Information Literacy itself. Whereas the clinical setting can be seen as separate from the nurse's experience of it, Information Literacy is not. Information Literacy – the experience of knowing when and why information is required, how to locate, critique, and use it - although contextually based, is itself not the experience of an external phenomenon. It is an experienced 'concept', a contextually meaningful abstraction.

A methodology used to investigate the experience of Information Literacy must avoid this duality – the 'separateness' of the experiencer and the experienced phenomenon - implied in Constructivism.

The Variations in the Experience of Information Literacy by Nurses

Although it may be true that Information Literacy itself is not an external phenomenon to the individual experiencing it, it is reasonable to suppose that each nurse will experience information literacy in different clinical and professional contexts and types of contexts and potentially, therefore, in different ways (Marton 1988). And that each specific clinical context will produce different experiences for different nurses in the different ways each addresses, or is able to address, the 'information problem' based on the complexity of knowledge the context 'requires' and their own intellectual and professional qualities. A true understanding of how Information Literacy is experienced would appear to require the description of its variations, rather

than a 'summary' of such experience as a description of generalised or most common experience, as given in Phenomenology. Bruce's research (Bruce 1997; 2006) has shown that Information Literacy, even in one specific context, may even involve a number of 'ways of experiencing' it employed simultaneously.

3.2.2. Addressing Aims 3 and 4

Aims 3 and 4 of the study are:

3. *To use the parameters of Information Literacy in Nursing to develop an outline of the structure and content of an evidence-based Information Literacy educational intervention for nurses*
4. To analyse the information literacy development process in nurses with a view to practical application and improvement of outcomes..

The Value of 'Variation' in Educational Development

The increasingly adopted 'relational' approach to Information Literacy education derived from Bruce's work ((e.g. Limberg 1999; Maybee 2006; Boon et al 2007; Williams 2007; Lupton 2008; Andretta 2010; Diehm and Lupton 2012)) is based on the understanding of Information Literacy in 3.2.1. Bruce's research into Information Literacy led her to the conclusion that Information Literacy education, to be effective, must be start with the understanding that individuals experience the phenomenon of Information Literacy in a limited range of ways of varying complexity, depending on

context and purpose. Effective Information Literacy education requires a picture of all of the ways Information Literacy is actually experienced, arranged hierarchically (so as to distinguish between experiences of varying complexity in which knowledge of varying complexity is developed), as a framework from which to base educational interventions. Based on a framework of actual lived experience, the educator no longer operates 'blindly' - not knowing what relevant experiences the student must be capable of and must be facilitated into. Appropriate learning materials are more likely.

Therefore to fulfil Aims 3 and 4 the study must generate a description of the range of Information Literacy experiences which are distinguishable, generalizable and able to be arranged hierarchically.

3.2.3. Summary of Characteristics Required in a Methodology for the Study

To investigate how Information Literacy is experienced by nurses, and develop educationally useful insights from such an investigation, it follows that a methodology is required in which:

- Experiences are investigated subjectively: the participant and experience are not treated as wholly separate entities
- Experiences are investigated in a way which is sensitive to the variation in the contexts in which participants experience the phenomenon
- Experiences are investigated in a way which is sensitive to the variation in which the phenomenon is experienced in any one context

- Variations in experiences can be highlighted and generalised and form part of a structured/hierarchical picture.

3.2.4. Considered Methodologies

Although the literature indicated which methodology was most frequently used to investigate Information Literacy experiences, no assumptions were made. An investigation of Information Literacy in Nursing, having (as described in the previous section) its own specific methodological requirements, may not necessarily be best investigated by such means. Several methodologies were inspected in order to be sure of the best possible approach and were mapped against the Aims and the points made in the analysis above. Phenomenography was, in fact, eventually selected as it seemed to have all of the characteristics needed to fulfil study's Aims

The three considered and rejected are briefly described below:

Grounded Theory.

Grounded Theory 'is founded upon a premise of gradually 'building theory from data' ' by asking questions 'on the ground', gradually recasting the focus of the questions based on the answers given (Carey 2012). A concept, such as Information Literacy is put in relation to other concepts such as 'creator of knowledge'. Perhaps this relationship, described in Section 1.1. could actually be 'proved' using Grounded Theory.

The selected methodology for this study, however, must provide a structured description of the *variation* in how Information Literacy is experienced; the meanings given to the concept in different contexts; something not claimed

for this methodology in any source (Carey 2012), the 'Theory' described being usually a generalized description or explanation. Chenitz and Swanson (1986) do report Grounded Theory's use in descriptive analysis; but the methodology doesn't develop descriptions of a range of experiences but works to reach a situation where

'One overriding or core [conceptual] category can explain the relationship between all of the others. The core category best explains how the problem is processed.' (Chenitz and Swanson 1986. p.8).

Phenomenology.

Phenomenology investigates how phenomena are experienced (Cerbone 2006) but was rejected due to its focus on investigation of the nature of the experienced phenomenon itself, and the commonality of experiences which yields the fundamental meaning of the phenomenon. The educational purpose of this study (Aims 3 and 4) means that the analysis of the variation and the 'architecture' of the variation in the experience of IL, is a key requirement. A relational picture of the variation of experience could allow us to map how that experience changes in response to educational interventions - and what interventions promote the development of a more sophisticated experience of the phenomenon.

Ethnography.

Ethnography is '*concerned with people and their everyday lives*' (Pickard 2011, p.141). Ethnography investigates an '*idea, question, problem, issue or concern that researcher(s) want to find out more about*' (Goodman 2011, p.2) in the context of the system of beliefs and the related pattern of actions

of a particular group in their particular environment (O'Reilly 2009). The researcher '*accumulates as many perspectives as possible within the setting*' (Pickard 2011, p.141). An understanding of the group and the individual's role in the group is sought through observation and interview (Pickard 2011). The researcher interprets these to develop 'webs of meaning' while attempting to exclude their own pre-judgements (O'Reilly 2009). '*The end product [is] a written account of all observations, conversations, discoveries, and insights gathered during the research process.*' (Goodman 2011, p.1). An account which gives the researcher's interpretation of the '*individual and shared realities*' (Pickard, p.143) of the group.

Pickard (2013, p.136) and Goodman (2011) suggest there are a range of potential roles for Ethnography in Information Science research:

Understanding users, the way they work, and the various challenges they face when trying to locate, retrieve and use information are all ways to improve service to the public, and each may be investigated through the use of ethnographic methods. (Goodman 2011, p.1)

Ethnography comes close to fulfilling the Aims of the study. It could describe a group's experiences and conceptions of Information Literacy in their interconnected variety and in the context of their working life. However Aims 3 and 4 seemed to require a picture of the variation in experience of the participant group which was formally structured and given hierarchy in terms of complexity, and so had the potential for being used for mapping educational progress. A structure that Phenomenography was felt to provide more fully.

Phenomenography

As reported by researchers who have made use of it (Bruce 1997; Andretta 2010; and others), Phenomenography is the methodology which can do all the required tasks described above - a second-order methodology (one in which interpretations are undertaken of the reported experience of participants) which is both non-dualistic and open to the variations in individual experience, and in which variation is the focus of approach and analysis but is understood to be limited and definable (Marton 1988). By mapping the variations of experience and their relationship, an 'outcome space' is produced, with the potential to provide educators with a detailed and comprehensive picture of the variations of how the phenomenon is experienced by a relevant group.

Andretta's (2007) paper on the relationship between teaching and learning theories based on the relational approach and the epistemological assumptions of Phenomenography makes the connection between the two explicit: both recognise variations in student perspectives and experiences. Experiences are understood to range from simple to complex. Education involves '*the learners' increased awareness of more complex ways of experiencing a phenomenon.*' (Andretta 2007, p.165)

As will be shown in Section 3.3., Phenomenography appears to be able to produce insights which can be used to inform educational interventions. In fact a 'Variation theory' of teaching and learning, which will be discussed in Chapter 9, has been developed from phenomenographic research findings (Åkerlind 2008).

3.3. Phenomenography

3.3.1. Introduction

Phenomenography originated in Sweden in the early 1970s. A methodology developed by Ference Marton and colleagues in the Department of Education and Educational Research in Gothenburg (Hasselgren and Beach 1997), to research the education process from the perspective of the student (Marton 1988).

Marton defined Phenomenography as

‘The empirical study of the limited number of qualitatively different ways in which various phenomena in, and aspects of, the world around us are experienced’. (Marton 1994, p.4424)

This involves the interpretation of descriptions of experiences of a phenomenon, usually derived from semi-structured interviews (Marton 1988). The experiences are generalized and categorized in the form of **Categories of Description**, and arranged in a logically inclusive structure, an **Outcome Space**, giving a picture of the collective experience of the phenomenon within the group under analysis (Marton 1994).

Phenomenographic studies are intended to yield the complete range of contextual meanings that the underlying concept has for the group, and the relationship between them (Marton 1988).

The notion of variation in experience being limited, that the variations can be described in an archetypal way, and the idea that an overall description of

the experience of a phenomenon can be developed from a logical relationship of the variations, are the distinguishing characteristics of Phenomenography (Marton 1988; 1994)

3.3.2. Experience and Knowledge in Phenomenography

What is the philosophical basis of Phenomenography? What are its understandings of 'experience' and 'knowledge'? On what principles are its claims to delivering knowledge of the experience of phenomena based?

These discussions make use of the terms **concept** -*an abstract idea*, and **phenomenon** – *an experienced concept*. The experience of concepts involves the meaning or meanings the idea takes on for the participant in the context that the experience describes. Such meanings are sometimes referred to as **conceptions** (Svensson 1989) in the discussions below.

Experience Versus Abstract Definition

In his introduction to a collection of papers on Phenomenographic practice, Entwistle (1997) describes an insight derived from observing his students struggling to define a concept such as 'antidote':

'We don't store definitions [of a concept] in memory, but ratherthe meaning resides within the interconnectedness of remembered instances, and has to be reconstituted.' (Entwistle 1997, p.127)

- remembered instances in which a concept operates in the real world of one's own experiences.

His students found it easier to give him examples of when they had experienced 'antidote' as a phenomenon – when they had sought treatment for a snakebite, for example, then give a definition of 'antidote'.

Phenomenography is a methodology in which participants are encouraged to explore Entwistle's 'remembered instances' in which a concept has been experienced (and is now a 'phenomenon – an experienced concept'), in order to determine the conceptions the participants have of the phenomenon. This is usually done through open-ended interviews – interviews which encourage the participant to expand on memories of experiences they themselves feel to be significant (Akerlind 2005b). The latter being regarded as essential to the validity of the analysis; experiences must be subjectively meaningful to be meaningful at all.

The researcher then analyses the descriptions of those 'remembered instances' to provide a picture of the concept – such as 'Information Literacy' in the current study - as a phenomenon rather than an abstraction. In other words, attempts to unearth the concept's operative, practical, meanings for a group of individuals experiencing it in various contexts and environments (Marton 1988).

A Non-Dualistic Approach to Experience

Phenomenography analyses concepts 'experienced in the World', with no separation between the concept and the world as experienced (Bruce 1997). Prosser and Trigwell (2007) contrast Phenomenography, as a qualitative methodology, with research done through a cognitive and information

processing perspective, in which the participant is understood to 'process' external data or experience in a similar way to a computer. Prosser and Trigwell (2007) emphasise the significant contrast of this perspective as well as that of Constructivist methodologies, in which knowledge is understood to be 'tested' on the external world and then modified, with Phenomenography which has a non-dualistic understanding of the participant and his or her environment: there is no separation or antagonism. Marton & Booth highlight this:

'There is not a real world 'out there' and a subjective world 'in here'. The world [as experienced] is not constructed by the [individual], nor is it imposed upon her; it is constituted as an internal relation between them.'

(Marton & Booth 1997, p.322)

The 'Limited Variation' of Experience and its Categorisation

In contrast to some other methodologies interested in the experience of phenomena, Phenomenography focuses on the range of meanings the concept has for the group in terms of the limited variation in the ways a phenomenon is experienced (Marton 1994).

That variation is seen as being limited (Marton 1988), definable in terms of a relatively small number of generalised 'Categories of Description', and with its own internal structure (in terms of the relationship between the Categories of Description), which is logical and often hierarchical (Ashworth and Lucas 1998). This yields the possibility of a structured description of the meanings the concept has for the group.

The belief in the limited nature of variation is a point of controversy.

However, it draws on evidence from a range of Phenomenographic studies, beginning with early work by Marton and colleagues (Marton 1988).

Phenomenography is concerned with the categorisation of the variation in experience, but also in the relationship between the variations; that is, in developing a picture of how a phenomenon is experienced, in its variations, by the whole group:

‘Categorization of participants’ experiences must lead on to a process in which different ways of understanding a phenomenon are logically and hierarchically interrelated [by the researcher] to establish a typology.’

(Ashworth and Lucas 1998, p.415)

and so to the development of a collective, definitive and comprehensive picture of how any concept is experienced: the complete range of meanings it has for the group.

‘The phenomenographic focus is on collective rather than individual experience.....Phenomenographic research aims to explore the range of meanings within a sample group, as a group, not the range of meanings for each individual within the group.’ (Åkerlind 2005a, p.323)

Epistemology

How does Phenomenography claim to arrive at knowledge about the subject of its analysis? Description is the main emphasis in Phenomenography (Svensson 1997). The centrality of description is based in the idea of knowledge (the knowledge to be obtained about how the phenomenon is

experienced) as describable variation and similarity in the meaning the concept has for the participants and the participant group. The ways in which that meaning can be generalized are explored, with generalized meanings being the aim rather than the starting point as in some other methodologies (Svensson 1997). Phenomenography seeks to retain the human content of the detailed description of a personal experience while focusing on the fundamental characteristics of the experience described. The latter involves '*abstraction, reduction and condensation*' (Svensson, 1997, p.167)

The Epistemological Value of Researcher Interpretation –

Phenomenography is a second order methodology, and attempts to construct a structured representation of the meanings given to experienced concepts by participants themselves (Marton 1988). Participants are encouraged to describe experiences that they themselves feel to be significant and in the way they wish to. The experiences described are then interpreted and categorised by researchers (Marton 1988).

The interpretation process has its obvious challenges: the interpretation of another's subjective experience is in itself not easy, and the corresponding creation of definitions or descriptions of the experiences may be prone to oversimplification or false emphases. However the chance of clearer and better organized account than participants themselves are capable of if unaided, is the aim (Ashworth and Lucas 1998). It must also be remembered that participants may be able to give many and rich accounts of experience of a concept without being conscious of it as a key part of their life-world

(Entwistle 1997). Participants may describe needing, locating and using information frequently without necessarily thinking of Information Literacy as something they can define, or are consciously aware of as a phenomenon, or feel capable of analysing abstractly (Entwistle 1997).

Limited Ways of Experiencing: the Epistemological Significance – As was alluded to above, Marton (1988) found, after conducting a number of studies in the 70s and 80s, that he and his colleagues could be confident in believing that any phenomenon was experienced in a limited number of ways; a hypothesis which he placed at the centre of the phenomenographic project. What is the epistemological significance? If the number of ways of experiencing a phenomenon is infinite or extremely large, then no knowledge of the variations of the experiencing of the phenomenon could be generalized from the data. One of the fundamental question-marks about the strength or even validity of Phenomenography arises from this hypothesis of Marton's. However, as has been stated, the successful completion of many studies since Marton's early work, in which the principle of limited variation has been applied, suggests his insight retains validity.

Knowledge of the Participant's 'Life-World' - On what basis is knowledge of the participant's experience assumed and 'recorded' as data? Ashworth and Lucas (1998) emphasise the paramount importance of a researcher's sensitivity to the 'individuality of conceptions of the world'.

Phenomenography must be grounded in the lived experience of the research participants. The setting aside of external theoretical conceptualizations is essential on the part of the researcher, both during data collection (to avoid

'leading' the interviewee), and analysis (to avoid false, imposed interpretations). The 'Bracketing' of preconceptions is required. This involves setting aside pre-conceived notions about the experiences being described by the participant and clearing the way for careful hearing (Ashworth and Lucas 1998). The researcher must be open to the participants' life-world without prejudice or premature judgement. For phenomenographers (and the validity of Phenomenography), the participant's 'life-world' (an understanding of the world based on subjective experience and the interpretation of the meaning and nature of that experience) is always valid (Marton 1988). Researchers must not query it; they must not adopt a position on the correctness or otherwise of the participant's understanding, conceptions and attitudes. The researcher's knowledge of the phenomenon under investigation results in a dilemma; knowledge of aspects of the phenomenon is essential to the researcher but must not be allowed to impair entry into the life-world of the participant (Ashworth and Lucas 1998).

3.3.3. Conclusion

The next section discusses the research methods implied by the underlying principles of Phenomenography discussed above. Phenomenographic method has been developed by researchers over a number of years from careful consideration of these principles. It was seen to be necessary to develop a method for the study based on careful analysis of the methods used by phenomenographers in the past.

3.4. Phenomenographic Method

What are the methods, or choice of methods, implied through the adoption of Phenomenography as a study's methodology? Phenomenography implies a specific and distinct method which will be discussed in detail; one which has been developed and modified by phenomenographers over the years (Ashworth and Lucas 2000), based on epistemological assumptions and understandings described above. The sections below discuss data collection and data analysis methods; and those means employed to ensure validity and reliability of findings based on understandings of the limitations of phenomenographic method. The more specific implications for the study are discussed in the relevant chapters.

3.4.1. Data Collection

The discussion below is an examination of the Data Collection methods employed in previous Phenomenographic studies developed from the concepts and assumptions of the Phenomenographic approach. Implications for the current study are discussed in Chapter 4 (Pilot Study); Chapter 5 (Methods and Plan) and Chapter 6 (Participants and Data Collection for Stage 1).

Phenomenographic data collection is mainly conducted through semi-structured Interviews (Bowden 2005), with

'The researcher clearly setting the interview topic through the use of a number of set questions, but then making substantial use of follow-up

questions to further investigate interviewees' responses.' (Åkerlind et al 2005, p.80)

in order to encourage the participant to freely describe their experiences of the phenomenon in a manner which reveals the range of meanings the underlying concept has for them in their 'world' (Marton 1988; 1994; Åkerlind 2005c).

A Key Priority: Interviews that Allow the Participant to Express their 'Relevance Structure'

In his summary of Phenomenographic research activity up to that point, Marton (1988) emphasised that it had been found to be essential that interview questions were as open ended as possible to allow the participant to express their 'relevance structure' – patterns of meaning given to a concept in the context of a range of different personal experiences. The interview should also be flexible in terms of direction and question order for the same purpose. There should not be too many questions nor questions with too many details developed in advance. Questions should follow from, and fit into, the context of what the participant is saying and is currently describing; they should be open-ended

'questions as open-ended as possible in order to let the subjects choose the dimensions of the question they want to answer. The dimensions they choose are an important source of data because they reveal an aspect of the individual's relevance structure. Furthermore, though we have a set of questions at the start of the interview, different interviews may follow somewhat different courses' (Marton 1988, p.154)

This notion of participants revealing 'dimensions' of an 'aspect' of experience will be taken up and developed by Akerlind (2005c) in an approach to data analysis adopted in this study (Chapters 4, 5 and 7).

What aspect of a question is answered, how, in what context and in what detail, reveal the participant's 'relevance structure' and the nature and detail of their experiences. The interviewer must develop follow-up questions which respond to the participant's own handling of the questions and corresponding exposition of those experiences.

Marton, however, admits that there are no exact algorithms for a method which is very much a 'discovery' one - requiring the researcher to respond sensitively and intelligently to the 'data' and the way in which the participant presents their own insights.

The Ashworth and Lucas Guidelines

Ashworth and Lucas (2000) summarised the accumulated experience of researchers in a series of guidelines for phenomenographic data collection which attempted to address the difficulties and apparent shortcomings which had arisen in phenomenographic practice. The guidelines emphasise the need to 'bracket' (attempt to prevent from influencing) presuppositions, and to develop an empathic understanding of the 'life-world' (*'the ... experienced world'* Ashworth and Lucas 2000, p.297) of the participant.

The guidelines themselves are quoted below in italics (Ashworth and Lucas 2000, p.300) with analysis and interpretation appended.

1. The researcher should tentatively identify the broad objectives of the research study, the phenomenon under investigation, recognising that the meaning of this area may be quite different for the research participant.

– Although Ashworth and Lucas (1997) and Marton (1988) emphasise that the researcher should do as much as possible to avoid imposing his or her ‘life-world’ onto the participant by restricting the ability to express thoughts and memories freely through overly detailed questions and comments.

Impositions which imply a correct way of looking at the subject under discussion. Ashworth and Lucas here imply that participants cannot express those thoughts and memories meaningfully without a clear understanding of the phenomenon under investigation. They emphasise that the interview must begin within a field of common understanding of the phenomenon.

‘The researcher and researched must begin with some kind of (superficially) shared topic, verbalised in terms which they both recognise as meaningful.’ (Ashworth and Lucas 2000, p.299).

The use of the word ‘superficially’ is perhaps meant to indicate a generality in the terms by which the phenomenon is defined. However, the key point made by Ashworth and Lucas is that the interview must be presented as being ‘about’ something. The participant needs an opportunity to reflect on the area of investigation and its significant issues, perhaps by a preliminary communication about the study and its purpose, and an opportunity to read the interview protocol. It follows that any jargon should be eliminated or defined in advance. In the current study, the interview began by asking the participant her views on EBP in Nursing. This gave a general context for a discussion of Information literacy experiences and their meaning without imposing ideas or priorities.

2. The selection of participants should avoid presuppositions about the nature of the phenomenon or the nature of conceptions held by particular 'types' of individual while observing common-sense precautions about maintaining 'variety' of experience.

– Again this seems to imply a balance between creating meaningful parameters for the study and not imposing an external interpretation of the phenomenon. Selecting categories of participant which to the researcher seem significant actually imposes such an interpretation before any data has been collected. This is not the same as selecting a general 'range' of experience or background to produce a comprehensive sample. Issues of sampling will be discussed further in Chapter 6.

3. The most appropriate means of obtaining an account should be identified, allowing maximum freedom for the research participant to describe their experience.

– Although other methods such as use of short written statements (Bruce 1997), and focus groups (Osborn 2011), have been used, the open nature of the lightly structured interview is seen by Ashworth and Lucas as the most ideal form to allow the life-world of the participant to emerge. Participants should be interviewed wherever they feel most comfortable and least inconvenienced – their workplace perhaps; or conversely, away from a stressful work environment. Ashworth and Lucas stress, based on the experiences of other phenomenographers, that it is essential that participants are comfortable in order to describe all their experiences in their complexity and variation. This requires and comfortable and stress free

environment. Reliability problems arising from a sense of discomfort in the participant are discussed under some sections of Chapter 12.

4. In obtaining experiential accounts the participant should be given the maximum opportunity to reflect, and the questions posed should not be based on researcher presumptions about the phenomenon or the participant, but should emerge out of the interest to make clear their experience

– The participant should be allowed to pursue a line of thought or memory unimpeded, without pressure to limit or conform to a structure or outcome. It would also follow that use of phrases by the interviewer such as ‘of course’, ‘don’t you agree’, ‘I suppose you don’t...’ should be avoided, however difficult it is to do so. However, entirely neutral questions are difficult to arrive at. Any question will contain within it an understanding of a phenomenon and its parameters. It is a normal human behaviour to pose questions in a tone and manner based on a conscious or subconscious reading of the person one imagines the other to be. It is also normal behaviour to want to direct a conversation at least to some extent. To overcome these ‘problems’ requires a large measure of self-awareness and sensitivity in the researcher.

5. The researcher’s interviewing skills should be subject to an on-going review and changes made to interview practice if necessary. For instance, stylistic traits which tend to foreclose description should be minimised.

– A Pilot study (Chapter 4) in the first instance, and then a review of methods after a further group of interviews allowed modification of the protocol and reflection on interviewing style.

6. *The transcription of the interview should be aimed at accurately reflecting the emotions and emphases of the participant.*

– Sensitivity is required but also accuracy. The use of italics and underlining may be of use to mark emphasis. Although this study made use of a transcriber, the transcription was checked against the interview by the researcher and location of high emotion and vocal emphasis were recorded.

Åkerlind's Question Types

Åkerlind (2005c) described interview questions she and her colleagues had developed to allow participants to explore their life-worlds without hindrance. Each interview began with questions of the *contextual* type which set the scene (re: Ashworth and Lucas step 1 above), including a description of the phenomenon in question to encourage the participant to begin to think about their experience of the phenomenon. The participant was now more able to answer *open questions* which explore the meaning structures the participant attaches to the phenomenon. These allow the subject to focus on the aspects of the phenomenon they regard as the most significant and meaningful to themselves. The next questions ask for *examples* of the participant's direct experience of the phenomenon; these also indicate the most meaningful aspects of the phenomenon by giving the pattern of significance that made the experience of the phenomenon coalesce as a distinct memory.

This breakdown of question type will be used in the Pilot Study (Chapter 4). Follow-up questions clarify certain words and phrases used by the participant.

Åkerlind (2005b) emphasises that follow-up questions should be of the 'why' not 'what' kind. That is, the researcher is not interested in the details of examples of experience of the phenomenon but the underlying meaning and context of the experience of the phenomenon which directed the participant to behave in a certain way. 'Answering 'why' will lead the subject to reflect on their understanding of the phenomenon.

Conclusion

The methods above were carefully assessed for their value and appropriateness in a Pilot Study (Chapter 4). This tested out a questionnaire based on Åkerlind's analysis of question types. The Pilot study also assessed points of interview style highlighted by Marton, and Ashworth and Lucas above.

3.4.2. Data Analysis

The discussion below is an examination of the Data Analysis methods employed in Phenomenographic studies. Analysis methods in such studies follow closely the epistemological concepts elaborated above.

In more recent studies, such as in the work of Åkerlind (Åkerlind 2005a; 2005b; 2005c), the early methods of Marton and colleagues have been elaborated further. The development of constructs such as 'Dimension of Variation' and 'Theme of Expanding Awareness' which allow for greater subtlety and detail in the data analysis process and outcome, while increasing logical consistency and decreasing potential sources of validity-

failure, have also (as will be argued below) increased the potential fields of application of phenomenographic method.

Data analysis implications for the current study are discussed in Chapter 4 (Pilot Study) and Chapter 7 (Analysing the Data from Stage 1)

General Principles

As has been discussed above, in phenomenographic interviews the aim is to sensitively allow participants to describe their experiences of the phenomenon under study in a 'relational' or contextual way, through descriptions of their experiences in the actual living and working world (Marton 1988; Åkerlind 2005a).

Sensitivity in the interviewing technique must be matched in the analysis of data. For Marton this process is not just a sorting process but a careful searching for the

'...most distinctive characteristics that appear in those data; that is, we are looking for structurally significant differences that clarify how people define some specific portion of the world' (Marton 1988, p.146)

The task of the researcher is to categorise and generalize from such structurally significant differences to produce a number of statements describing the several archetypal ways in which the phenomenon in question is experienced by the participant group, statements known as **Categories of Description**.

Åkerlind (2005a) emphasises that the phenomenographer is not in the business of finding a set of diverse meanings but a coherent and meaningful structure for different descriptions of experiences, to produce a holistic view of the experience of the group. Therefore, as Åkerlind (2005a); Brammer

(2008); Kaminsky (2009); and others describe, after the development of Categories of Description, there follows the seeking out of structural or logical relationships linking them into meaningful wholes. These relationships represent the structure of the **Outcome Space**: a 'diagram' of the experiencing of the studied phenomenon.

Through Empathy to Validity

For Ashworth and Lucas (2000) Empathy is a key tool in analysis of interview transcripts. Not only does it lead researchers away from the tendency to impose their own interpretations of the value or lack of value, the validity or lack of validity of a participant's thoughts and activities, but it encourages an interest and fascination in the otherness of the participant's own 'life-world'; the participant's own framework of value and significance. *'Empathy in this context involves imaginative engagement with the world that is being described by the student.'* (Ashworth and Lucas 2000,p.299).

In an earlier paper, Ashworth and Lucas (1998) discussed the maintenance of empathy and sensitivity through 'Bracketing'. Scientific theories; other 'evidence' from external authoritative sources; prior hypotheses; assumptions of 'cause' should be put to one side by the analyser. (Section 3.4.3 below discusses 'bracketing in greater detail). Ashworth and Lucas indicated that some research studies have declined into a form of partial phenomenography, with pre-determined categories of description, even categories established by others' research being used.

Marton (1994) made explicit the essentiality of the researcher not judging responses and emerging categories as fitting in or otherwise to their own

pre-conceived ideas about the phenomenon, the researcher must focus on the similarities and differences between the participants' views of the phenomenon.

Two Schools of Data Interpretation Method

There appears to be two broadly defined 'schools' of data analysis method. One, following Marton (Marton 1988; Marton & Booth, 1997), **at an early stage reduces the collection of transcripts to 'utterances' or 'quotes'**, each with a perceived and distinct meaning, which are then brought together into categories on the basis of their similarities. Although part of the 'meaning' ascribed to an utterance comes from its context within a transcript, the transcript is no longer a data unit in itself.

Åkerlind's (2005a; 2005c) method, derived from work by Dall'Alba (1994); Bowden (1994) and Prosser (1994), in contrast, **allows the transcript to retain its significance throughout the analysis**. While key sections of each transcript are marked as being particularly significant, they '*continue to be considered 'in situ''* (Åkerlind 2005a p.325). Individual phrases cannot be seen as significant in themselves, the aim is to look

'as much as possible beyond the particular words chosen by the interviewee to their underlying intentional attitude towards the phenomenon' (Åkerlind et al 2005, p.86).

Experiences of the phenomenon may be developed by the participant over the whole interview, often bringing up further elucidatory additions and elaborations throughout.

'The whole transcript should be seen and treated as a set of interrelated meanings, which can best be understood in relation to each other.'
(Åkerlind 2005a p.327).

Any decontextualization from the transcript carries the danger of losing the context of selected quotes which might affect the perceived meaning (Bowden, 1994). However Åkerlind (2005a; 2005b) emphasises that that both the emerging Categories of Description and the transcripts must be focussed on as a set and not individually to maintain focus on the collective experience - and the eventual Outcome Space.

'Phenomenographic research aims to explore the range of meanings within a sample group, as a group, not the range of meanings for each individual within the group. This means that no one interview transcript ... can be understood in isolation from the others.' (Åkerlind 2005a, p.323)

The individual transcript is also not equivalent to a Category of Description. (Bruce 1997). *'The meaning of the phenomenon for any one participant may vary under different circumstances'* (Åkerlind 2005b p.81).

Marton's method

While those who follow the early Marton approach agree on the importance of considering the larger context when interpreting and selecting excerpts from the transcripts, working with whole transcripts (despite Åkerlind's stated awareness of the issue) is seen as having the danger of encouraging an analytic focus on the individual interviewee, rather than the group of interviewees as a collective. Also, taking a whole transcript approach to analysis may reduce the clarity of the key aspects of meaning, because the

meaning a phenomenon holds for an individual may vary during the course of an interview.

However a major disadvantage of this method is the risk of 'cherry-picking' of what seems to be relevant or important to the researcher and abandoning what doesn't – this results in great risks that the participant's life-world will be lost under that of the researcher's.

There are several examples in the literature of Marton's method being employed, especially in Sweden. Arvidsson et al (2001) read through each transcript several times to get 'a sense of the whole'. At the same time 472 separate 'narratives describing conceptions' were extracted from the total. The narratives were analysed into qualitative similarities and dissimilarities in the experiencing of the phenomenon. After repeated re-examination, those showing similarities were brought together into categories.

Aflague and Ferszt (2010 p.250) analysed their data using Marton's 'seven steps' and developed the following protocol. :

Familiarization - Once the audiotapes are transcribed, the transcripts are read a number of times while listening to the audio tape.

– The value of an iterative process at this stage is mentioned elsewhere (Arvidsson et al 2001; Åkerlind 2005c)

Condensation - The most significant statements are given a short but representative version of the complete dialogue concerning the phenomena of interest.

Comparison - The selected significant dialogue excerpts are compared in order to find sources of variation or agreement.

- The development of 'utterances'.

Grouping - Answers that appear to be similar are put together.

Articulating - A preliminary attempt is made to describe the essence of the similarity within each group of answers. Grouping and Articulating may be repeated several times.

Labelling - The various categories are denoted by constructing a suitable linguistic expression.

- The creation of Categories of Description.

Contrasting - The obtained categories are compared with regard to similarities and differences

– The beginning of the development of the Outcome Space.

Åkerlind's method

Åkerlind (2005c) described in detail her own adaptation of the transcript-based approach, an example of a later, more highly developed, version of this method.

The first stage involves reading through each transcript three times, on the third reading making notes on each, summarising key 'issues and themes' emerging in the context of the others.

The second stage involves grouping 'similar' transcripts together after re-reading both the transcripts and the notes several times.

The third stage involves re-arranging the groups after further readings, and focusing on the search for both similarities and differences in the overall

meaning in the transcripts. This then evolves into a search for a number of individual

‘dimensions of variation in meaning that ran across the transcripts....[and] themes of expanding awareness running throughout the set of transcripts as a whole, where each theme linked a set of different dimensions of variation.’ (Åkerlind 2005c, p.121).

Dimensions of Variation of Awareness of the phenomenon are simple contextual statements of experience of *‘different aspects of the phenomenon that were referred to in some transcripts but not in others’* (Åkerlind 2005c p.122). Dimensions vary in degree of complexity of experience and therefore of degree of awareness of the complexities of the particular aspect of the phenomenon they are associated with.

Dimensions of variation are developed by an iterative connection, definition and modification process in which expressions of experience which seem to be related and to add to/build on each other, within and then across transcripts, are gradually worked into a defining statement.

The ‘aspects’ of the phenomenon of which the Dimensions are expressions of experience, are **Themes of Expanding Awareness** - in practical terms contexts or fields of operation in which participants experience the phenomenon in their Life-world. The Themes are derived initially from the Second stage but are developed further through the attempt to group the Dimensions of Variation in meaningful ways.

The development of a number of Dimensions of Variation which can be grouped into Themes of Expanding Awareness leads to the formulation of

Categories of Description in which dimensions from all of the different Themes (hence for all aspects of the phenomenon) at the same comparative level of sophistication of experience are brought into logical unity.

The several Categories, each representing the experience of the phenomenon at a particular level of sophistication from minimal to maximum awareness of the complexities of the phenomenon, can then be brought into logical connection to produce the **Outcome Space**, often by arranging them linearly from least to most complex experience.

The Pilot study (Chapter 4) examined both the Marton and Åkerlind methods, and drew conclusions on which was the most appropriate by carefully determining strengths and weakness in the context of this particular study.

Categories of Description

The end product of data analysis processes is the 'Category of Description', an archetypal representation and description of a way of experiencing the phenomenon being investigated. Each Category of Description 'represents a qualitatively different way of experiencing [that] phenomenon.' (Irvin 2005, p.102). 'Represents', because '*an abstraction of the collective meaning of similar conceptions*' (ibid) expressed by participants, as interpreted by the researcher (Bruce 1997). They are '*a way of describing a way of experiencing something*' (Marton 1994, p.175); or, more specifically, '*structurally significant differences [in 'descriptions of phenomena'] that clarify how people define some specific portion of the world.*' (Marton 1988, p.146).

Ashworth and Lucas emphasise that even though the Category of Description is developed from analysis by the researcher, it must be always find a source in the participants' own descriptions of their relevant experience.

'Phenomenographic research must be grounded in the lived experience of its subjects, otherwise findings 'will be unsound and the categories of description will be arbitrary.' (Ashworth and Lucas 2000, p.297)

The Structure of Categories of Description

Marton and Pong (2005) identify internal structures of Categories of Description. Each conception has a referential aspect – i.e. the 'meaning' given to the phenomenon being experienced, and a 'structural' aspect –the characteristics of the phenomenon focused on in that conception of it, often in the form of how it is 'performed'. These can be seen to correspond to the **Noema** and **Noesis** of Husserl, from his analysis of the internal structures of experienced Phenomena in his *General Introduction to Pure Phenomenology* (1913). Bruce (1997, p.111) similarly refers to *referential* and *structural* internal aspects of Categories of Description; for Bruce, the former '*establish the essential parts of the meaning being attributed to Information Literacy in each category*' (Bruce 1997, p.112). The latter, also called 'structures of awareness' show the ways in which the process characteristics of Information Literacy in the contexts of 'Information technology' 'Information Use' and 'developing a Knowledge base' have greater or lesser prominence.

Åkerlind (2005c) as shown above, specifies the construction of Categories of Description from 'Dimensions of Variation of Experience' grouped in 'Themes of Expanding Awareness' of the phenomenon. Each Category's constituent Themes and their Dimensions being potentially noematic or noetic in nature.

The Outcome Space

The final stage of Data Analysis is the construction of the Outcome Space. The Outcome Space is the diagrammatic representation of the relationship between the Categories of Description, giving a whole picture of the experience of the phenomenon by the participant group. Åkerlind defines Outcome Spaces as '*a way of looking at collective human experience of phenomena holistically*' (Åkerlind 2005a, p.323) despite the variation in the perception and experience of the phenomena. Outcome spaces

'Represent the full range of possible ways of experiencing the phenomenon in question, at this particular point in time, for the population represented by the sample group collectively'. (Åkerlind 2005a, p.323)

The Outcome Space: Logical or Empirical Structures?

What is the nature of the relationships between Categories of Description exhibited in the structure of the Outcome Space?

Walsh (1994) discusses variation in views among phenomenographic researchers as to:

1. the degree to which a logical structure needs to emerge as directly as possible from the data; and

2. the degree to which it may more explicitly reflect the professional judgement of the researcher.

Åkerlind (2005c) defines these two approaches as 'logical' and 'empirical'.

The logical approach attempts to create relationships between the categories which have a logical meaning but may not be clearly visible in a relationship between transcripts (and so is in a sense inadequate). This is because, as discussed above, it is not likely there will be a one-to-one relationship between Categories and transcripts –phenomenography attempts to capture all ways of experiencing the phenomenon within the group not the different experiences of the members of the group.

The empirical approach emphasises that the data is all that the researcher has to work with and must be the basis of findings from a methodology which emphasises its empirical nature (in contrast to some others). This must be the emphasis even if the resultant Outcome Space is looser and less 'neat'. Both Walsh and Åkerlind emphasise that these positions are seldom held in extreme form, as the final outcome inevitably reflects both the data and researchers' judgements in interpreting the data. However, Walsh suggests that too strong an emphasis on constituting logical structural relationships may lead to potentially ignoring aspects of the data.

Marton and Booth (1997) present three primary criteria for judging the quality of a phenomenographic outcome space:

1. that each category in the outcome space reveals something distinctive about a way of understanding the phenomenon;
2. that the categories are logically related, typically as a hierarchy of structurally inclusive relationships;

3. that the outcomes are parsimonious—i.e. that the critical variation in experience observed in the data be represented by a set of as few categories as possible.

which is a blending of empirical and logical approaches.

Ashworth & Lucas (2000) emphasize the importance of not prioritizing the search for structure too early in the process of developing the Outcome Space, as this may lead to not fully appreciating aspects of the meaning to be found in the data. Other researchers emphasise the danger of not drafting a structure until too late in the process as structure and meaning are established together and simultaneously in Phenomenography (Åkerlind 2005a).

3.4.3. Potential Limitations of Phenomenographic Method

Due to limitations in the phenomenographic approach which may lead to failure to obtain a true picture of the Participant's Life-world, researchers have developed a range of methods for ensuring validity and reliability. These are discussed below and in later chapters.

For Ashworth and Lucas (2000) a limitation of phenomenographic method lies in the potential contamination of the participant's life-world through actions and presuppositions of the researcher. What can be done to overcome this?

Phenomenological Reduction

Phenomenography and Phenomenology share a non-dualistic view of the relationship between the individual and the world:

‘In the phenomenological view, person and world are inextricably related through a person's lived experience of the world.’ (Sandberg 2000).

This relationship allows phenomenographers to use Phenomenological reduction (Sandberg 2000) as a strategy for achieving interpretative awareness, and as a framework for achieving validity and reliability for research findings. The aim is to allow the researcher to ‘think-in’ to the participant’s life-world without distraction or contamination from external ideas or the researchers own attitudes and preconceptions.

‘Phenomenological reduction means striving to withhold theories and prejudices about the research object.’ (Sandberg 2000, p.14) so that no interference is introduced preventing a discovery of the ‘lived experience’. The first step of the reduction is the ‘Epoche’, the term originally used by Edmund Husserl (Langdrige 2007; Cerbone 2006). Only by clearing away the preconceptions of how the experience has been arrived at can the true experience be described. This is also known as ‘bracketing’ (Langdrige 2007).

The next stages are:

Description –participants are encouraged to describe the experience of the phenomenon in as much detail as possible.

Horizontalization –each aspect of the described experience is treated as significant. No externally imposed judgments of significance are made, or

hierarchies are imposed, at too early a stage. The importance of Horizontalization became clear in the Pilot Study.

Verification – analysis is checked repeatedly against the transcripts to maintain empirical validity.

(based on Langdridge 2007, p-18-19)

The application of these methods is discussed in Chapters 4 and 6 and 7.

Communicative Validity

Sandberg's (1997) 'Communicative validity' attempts to assure that communication of experience by the participant is sufficiently free-flowing and accurately interpreted to lend a claim of validity for interview-based research findings. It has three parts:

- i. within interviews,
- ii. during analysis,
- iii. discussing results with researchers and relevant professionals.

These stages were followed in the present study and will be discussed in detail in other sections. In summary:

- i) Interviewees were informed about the subject of the interview and the fact that they are free to direct it as they wish and include as much experience as they themselves think relevant. They are also assured that there are no right and wrong answers. Open-ended questions are used to maintain a dialogue. (compare: Ashworth and Lucas 2000).

'Communication' should flow between the interviewer and participant so that the participant's responses are less likely to be cramped and self-conscious, and will be true to their experience.

ii) During data analysis, each transcript is focussed on as a whole and decontextualizing individual quotes is avoided where possible (see Chapter 4 for other reasons for choosing the Åkerlind data analysis method). Decontextualization is regarded as a major invalidating risk in 'Communicative Validity'. However the corresponding risks in over-focusing on transcript units are not highlighted.

iii) The third phase of communicative validity involves obtaining external feedback.

Additional Reliability Checks

In what additional ways can the interpretations in a phenomenographic study be assured as being accepted as reliable?

There are a range of techniques in interviewing (data collection) and data analysis which have been developed to maximise the reliability of phenomenographic findings (Mann 2009), and were employed in this study, and these will be discussed in detail in the relevant sections. They are:

1. Pilot interviews are conducted to develop interviewing skills and a draft interview protocol.
2. A protocol is used to make the interviews as consistent as possible

3. The interview protocol is developed in such a way as to discourage leading questions, and questions that suggested a particular way of experiencing to the interview subjects.
4. Each interview starts with the same information and introductory questions.
5. During the interviews, an open-ended but focused interviewing technique is used. This allows the subjects to focus on the aspects of the world they believed were important rather than ones that fitted in to preconceived assumptions and theories.
6. Data is in the form of transcripts to maintain accuracy.
7. The transcript remains the focus of interpretation. This involves constantly going back to the data as a whole, and reading statements in context. It also involves admitting to inconsistencies between transcripts during the analysis process, rather than trying to constrain the data to appear consistent.
8. The Categories of Description are developed in an iterative fashion, in which the inconsistent transcripts act as prompts for a different way of viewing the categories of description.

Post-Analysis Checks: Participant Validity

What can be done to check on the validity of the life-world described in the study? Uljens (1996) suggests interviewees as sources of validity checks.

Do the Categories of Description 'make sense' to them; do they correspond to their realities? As the principal purpose of this study is to develop an educationally useful picture of how nurses experience Information Literacy to

replace a 'non-validated' non-nurse view, it would seem to be appropriate to employ participants as validity checks. However, as Åkerlind (2005a) points out, Categories of Description are not based on the life-worlds of individual participants and therefore participant validity has its potential limitations. This may be the case, however the question asked of a participant does not need to be 'is this your world?', but can be the broader but still valuable 'does this correspond to a world which make sense in terms of your understanding of your profession and its environment?' Chapter 8 introduces the comments of 3 individuals: one a Participant in the study and 2 others who are experienced nurses and nurse academics.

3.5. Summary

As described above, Phenomenography was established as the methodology appropriate for the study. The methods of data collection and data analysis implied by the methodology now required practising and testing and, in the case of analysis, selection of the most appropriate alternative. Therefore a Pilot Study was conducted, and is described in Chapter 4 below. Chapters 6 and 7 show how the relevant findings from the Pilot were incorporated into the study's final data collection and analysis protocols.

Chapter 4

Pilot Study

4.1. Introduction

This chapter discusses the Pilot Study.

Åkerlind (2005c) and Åkerlind et al (2005) strongly recommend pilot studies to investigate appropriate interview protocol content, interview technique and methodological alternatives.

This pilot study was particularly concerned with:

- Testing the **data collection** methods to allow practical insight into the process of the phenomenographic interview and the structure and format of the interview protocol.
- The evaluation of the **two data analysis methods** discussed in Section 3.4.2. in order to determine their relative appropriateness for this study.
- Gaining experience in 'bracketing' (discussed in 3.4.3.).

4.2. Participants

Åkerlind (2005c) recommends 3 participants as an appropriate number for a pilot study. The participants selected and approached were academics, with many years of clinical and teaching experience. They were regarded as suitable as they had very wide Clinical Nursing experience and were familiar with being interviewed. As the purpose of the Pilot Study was to analyse Data Collection and Analysis methods, neither size or 'bias' of the participant group were regarded as relevant considerations.

There follows a brief description of the three Participants:

Participant 1

A Senior Lecturer in Nursing with a background in Critical Care. She has taught an EBP module for many years and has been teaching since 1994. The Interview took place at the Paragon House campus of the University of West London.

Participant 2

A Senior Lecturer in Nursing now teaching EBP and research methods for dissertations and postgraduate courses in cardiothoracic nursing.

The Interview took place at the Paragon House campus.

Participant 3

A Senior lecturer in Adult Nursing. Course leader for an Overseas Nurses programme with previous clinical specialism in Trauma and Orthopaedics.

The Interview took place at the Paragon House campus

The participants were given an overview of the purpose of the research study and asked if they would like to take part. A copy of the interview protocol was sent to each participant several days before the interview.

4.3. Data Collection Methods and their Evaluation

4.3.1. Interview Protocol

The Interview questions are given below. For reasons discussed in Chapter 3, the questions were designed to promote reflection on experience rather than opinion.

Ashworth and Lucas (2000)'s guidelines discussed in Section 3.4.1. were used as a general basis of approach for data collection in the Pilot Study. Åkerlind's (2005c) description of interview questions: *contextual; open; examples; follow-up* was also used as a guide. Åkerlind's (2005b) advice that the follow-up questions should be of the 'why' not what' kind was adhered to as much as is possible. The protocol had the following structure and content:

Contextual

- First to get us going, can you tell me what your current job is?

Open

- What does EBP mean to you?
- What part does research evidence play in good practice?
- What is your picture of a nurse who uses information effectively

Examples

- Can you give examples of ways you use information to inform your practice?
- How do you use information in your day to day work?
- Tell the story of an occasion when you used information effectively

Follow up questions

- What are your first thoughts?
- How do you get from a clinical problem to an information need?
- Do you begin with a plan? If not, why? What is your usual sequence of thoughts and activities?
- What processes and activities do you use?
- Describe your thought patterns
- Describe the specialist knowledge you use
- How do you appraise what you've done so far?

(some questions based on Bruce 1997, p.95)

Bruce (1997) found the expression 'effective information user' to be both more likely to be understood than 'information literate person' and less likely to create an overly technical impression of what was meant, and this was adopted.

Participants were put at ease and the general subject and purpose of the interview was repeated. If the participant had not had time to read the preparatory material (see below) then it was summarised. Participants were reminded that they should feel free to direct the interview themselves, include anything they felt relevant, and not to feel that the interviewer was 'not interested' in something they themselves felt may be pertinent.

Once the interview got underway, the participant was given the maximum opportunity to reflect and elaborate. Questions were ordered in whatever way seemed conducive to maintaining the flow of the participant's thoughts. The interview continued until all questions had been answered, but also until the interviewee felt they had nothing further to contribute. The interview was recorded.

4.3.2. Evaluation of Interview Structure and Method

Preparation proved to be important. The participants were sent the following via e-mail:

- a description of the purpose of the interview
- a description of the type of interview hoped for: open and reflection-driven and focused on their own experiences and priorities.
- a copy of the interview protocol.

A participant who hadn't had time to read the e-mail was somewhat stilted and unfocussed and prone to shorter and unreflective answers to begin with.

It was found that flexibility in the order and wording of the questions was essential, as was the use of improvised (though protocol-based) follow-up questions to maintain the reflective flow. It was important that a participant was allowed to continue to reflect as extensively or tangentially as they wished – also to maintain the flow of the interview but also, as would be discovered, to allow the full nature and complexity of experiences to be recorded. For the same reasons participants had to be left to determine the direction of the interview - some questions were brought forward or left back to avoid what the interviewer intuited would be a jarring ‘interruption’, preventing a participant from continuing with their line of thought.

Assessments of the ‘value’ of comments and directions taken by the interview as the interview progressed were usually mistaken as well as inappropriate for this methodology.

The analysis process frequently showed that comments which seemed tangential or otherwise irrelevant at the time were filled with significance. Forcing the interview into areas that the interviewer felt would ‘yield’ the most interesting comments was quickly seen to be counterproductive. This could not be correctly guessed beforehand; for instance, one participant’s thoughts on information literacy’s role in the nursing profession evolved from a discussion of their earlier experiences as a nurse, another from when discussing their students.

The necessity in each aspect of experience being given attention and ascribed value (Horizontalization) in order to maintain Validity has been highlighted in the literature (Langdridge 2007).

4.4. Data Analysis Methods and Their Evaluation

As described above, one of the aims of the pilot study was to help the researcher develop the analysis techniques described in the literature (Section 3.4.2); in particular, experience in bracketing preconceptions.

Another key purpose was to investigate the qualities of the Marton and Åkerlind methods of data analysis and their likely appropriateness for the study. Both methods were attempted, and the outcomes are described below.

4.4.1. Using the ‘Marton Method’

As was discussed in the relevant part of Section 3.4.2, Marton (Marton 1988; Marton & Booth, 1997) did not use the transcript as an entity in the data analysis process. The transcripts are immediately reduced to a number of ‘utterances’ or ‘quotes’, each with a specific meaning (partly, at least, from its immediate context within the transcript), which are resolved into categories on the basis of their similarities.

Marton’s approach is based on the perceived danger of an analytic focus on the individual interviewee rather than the group of participants as a collective. However, the danger of the interviewer losing the significance of an apparently meaningless utterance when taken out of the context of the interview and other statements in ‘distant’ parts of the interview – an utterance which may, when seen in that context be significant in the description of a life-world - would need to be evaluated carefully.

Aflague and Ferszt (2010, p.250) interpretation of Marton's 'seven steps' of analysis was used:

Familiarization - Once the audiotapes are transcribed, the transcripts are read a number of times while listening to the audio tape.

Condensation - The most significant statements are given a short but representative version of the complete dialogue concerning the phenomena of interest.

This proved difficult to do as the conception often seem to develop over several sentences or built on a range of comments in different parts of the transcript or from other transcripts. What turned out to be 'significant' only became so when associated with other statements elsewhere and usually had little 'independent life' of its own.

Comparison - The selected significant dialogue excerpts are compared in order to find sources of variation or agreement.

Difficulties in finding meaningful 'statements' led to difficulties in comparison and contrast. Similar difficulties occurred in the following three stages.

Grouping - Answers that appear to be similar are put together.

Articulating - A preliminary attempt is made to describe the essence of the similarity within each group of answers. Grouping and Articulating may be repeated several times.

The inability of simple phrases to properly represent what were turning out to be complex experiences, resulted in great difficulties in grouping them meaningfully...

Labelling - The various categories are denoted by constructing a suitable linguistic expression.

...and forming meaningful categories.

Contrasting - The obtained categories are compared with regard to similarities and differences

As this shows, the Marton method was unable to facilitate the development of meaningful outcomes.

4.4.2. Using the 'Åkerlind Method'

The alternative method of data analysis (Dall'Alba 1994; Bowden 1994; Prosser 1994; Åkerlind 2005a; 2005c), in contrast, treats the transcript as a key unit of data throughout the data analysis process. However Åkerlind (2005a; 2005b) emphasises that that both the emerging Dimensions of Variation, Categories of Description, and the transcripts must be focussed on as a group and not individually to maintain focus on the collective experience - and the emerging Outcome Space. The transcript is not the same as a Category of Description as each participant may report different experiences of the phenomenon during the interview.

Åkerlind's (2005c) protocol was used, representative of the most recent and highly developed form of the method:

1. Read though each transcript three times, on the third reading making notes on each, summarising key 'issues and themes' emerging in the context of the others.

The transcripts were read in sequence and this process was then repeated twice. It is instinctive to want to begin making notes immediately; however the value of reading the transcripts twice before doing so was clear when the

significance of individual statements was seen in clearer, or different, focus with knowledge of the whole transcript. The discussion of the relationship between Information Literacy and Evidence-Based Nursing Practice resulted in an interview in which the participant seemed to need to 'come back around again' to further develop the description of an experience which also involved bringing together widely 'located' previous comments.

2. Group 'similar' transcripts together after re-reading both the transcripts and the notes repeatedly.

There was difficulty in grouping such a small number of transcripts, but overall 'themes' emerged which could have theoretically been used to group with others of similar theme though it was difficult to see the benefit of this in such a small sample.

3. Re-arrange groups after further readings focussing on searching for similarities and differences in the overall meaning in and across the transcripts

...looking for 'Dimensions of Variation' in meaning that ran across the transcripts...

As described in Chapter 3. **Dimensions of Variation** in experience of the phenomenon are simple contextual statements of experience of an aspect of the phenomenon that distil experience across some of the participant group. Åkerlind defines them as 'Different aspects of the phenomenon that were referred to in some transcripts but not in others' (Åkerlind 2005c p.122).

A number of these could be sketched out.

Statements describing Information Literacy experiences were underlined and briefly summarised so that links in meaning and significance to other seemingly related statements elsewhere in the transcript and then in the other transcripts could be made. This linking allowed further development and/ or modification made by the participants to the description of experiences given in the initial statements to become clear. The brief summary statement was modified accordingly. The result of this process seemed to be a more detailed, 'true-to-life' expression of experience than obtained from the initial simple statements.

This process was repeated several times until the final form of the Dimension of variation was achieved which seem to satisfactorily describe the aspect of experience identified.

...and Themes of Expanding Awareness running throughout the set of transcripts as a whole, where each theme linked a set of different 'dimensions of variation'

A Theme of Expanding Awareness is a 'context' or 'field of operation' in which participants experience the phenomenon in their Life-world. Each represents an 'aspect' of the phenomenon of which a particular group of Dimensions of Variation represent varying depth of experience.

This proved very difficult with a small sample, but three Themes could be sketched out.

4. Development of Categories of Description, representative ways of experiencing Information Literacy. By bringing together Dimensions of Variation from each of the different Themes (hence for all aspects of the phenomenon) at the same comparative level of sophistication of experience.

This proved to be difficult due to the limited data. There were few Dimensions of Variation and though several Categories were sketched out, many were based on only one Dimension.

Despite these problems it could still be asserted that the Åkerlind method, in contrast to the Marton method, allowed meaningful and interesting outcomes to be developed.

4.4.3 Comparison of Data Analysis Methods

The Marton method failed to generate any meaningful conclusions.

However, it became clear that the Dimensions of Variation identified through the contrast and grouping processes used in the Åkerlind method could be developed into a number of provisional Categories of Description.

Three Themes of Expanding Awareness could be defined using the Åkerlind method.

- i. *What is the process of Information Literacy*
- ii. *What is the meaning of Information Literacy– what is the content of its meaning in practice?*
- iii. *The meaning of information – what is information?*

The three Themes can be compared to those determined in the full study (see Section 8.5). (i) corresponds closely to Theme of Expanding Awareness No.5. *Information Literacy experienced within application of Skills and Processes of evidence and other information gathering*; and also Theme of Expanding Awareness No.6. *Information Literacy experienced in the context of an Understanding and Knowledge of the principles and concepts behind*

evidence and other information gathering. (ii) corresponds to Themes 1 to 4 where 'meaning of Information Literacy in practice' is given detail. (iii) to Theme of Expanding Awareness No.7. Information Literacy experienced through Applicable conceptions of information.

The seven Categories of Description were:

1. Information Literacy is experienced in the successful collection of sufficient and persuasive evidence to justify change in practice.
2. Information Literacy is experienced in an ethical context, in the successful accumulation of evidence to establish what is the most ethically appropriate care
3. Information Literacy as experienced in the successful gathering of evidence to support the facilitation of culture change in the clinical environment
4. Information Literacy as experienced in the successful obtaining of information of clinical value to enable nurses to contribute to a multidisciplinary team
5. Information Literacy is experienced in the building up of professional competence through the location and application of key scientific or psychosociocultural background knowledge
6. Information Literacy is experienced in the successful accumulation of sufficient and appropriate evidence to justify care strategies to, and re-assure, patients and family
7. Information Literacy is experienced in the successful establishment and support of an autonomous status for the nursing professional by providing evidence for independent and defensible clinical opinions.

As will be seen, these correspond well, if not to Categories of Description in the final study, then at least to several of the 70 sub-Dimensions of Variation.

4.5. Overall Conclusions and Implications for Main Study

Phenomenography's strengths came into focus in this Pilot Study– its ability to develop logical structures which give a picture of the experience of a phenomenon, while allowing the ability to read into the structure as much of the complexity of that experience as is consciously and practically possible. The lack of 'absolute' sensitivity which can be assumed due to an external interpretation of another's experience, and the fixing of that experience into 'categories', is less relevant than it might be in a *phenomenological* attempt to determine what the phenomenon 'was' in itself. However the methodology makes great demands on researchers: both of intelligent interpretation through sensitivity to verbal meanings, and in the creation of larger meanings from them. As well as sensitivity to participants and their 'life-worlds', which must not be crushed under presumptions but must gently yield its categorizable experiences.

4.5.1. Data Collection

It quickly became clear that the interview should range widely over the contexts and ideas around Nursing practice in general, not just on information literacy. The provisional Categories of Description drafted from the Pilot Study made clear that 'how information literacy is experienced' is not separable from subjective and contextualized meaning structures arising from the philosophical and practical ideas behind the dynamics of EBP and Nursing Practice generally.

The interview itself must be allowed to range where the participant wishes to take it. The 'bracketing' of pre-conceived notions of the researcher has been

discussed above, but the most dangerous appeared to be assumptions of what is 'relevant'. On a number of occasions, the researcher felt that the interview was veering off into what he momentarily believed was irrelevancy – analysis of the transcript proved that to be an error. The interviewer, remembering that the methodology required the participant be allowed to direct the interview so that their own criteria for relevance and significance came through, resisted the desire to 'take control' of the interview's direction. Once the interviewer began to 'trust' the participant to be the better judge of the value and significance of what is being discussed, then the interview became more relaxed and the participant more prone to detailed and complex thought. The interviewer was also made aware of his initial comparative ignorance of many issues. A valuable lesson.

4.5.2. Data Analysis

It became clear that the relationship between information literacy and Nursing practice that seemed to be emerging was a complex one. The ideas expressed seldom took the form of simple phrases or sentences but emerged with the comparison and accumulation of statements made over a complete interview. The Åkerlind method, unlike the Marton method, allowed for this complexity. Dimensions of Variation could be formed by reading over many parts of a transcript as well as across transcripts. The wide-ranging context of many statements within an interview and the complexity of the elements of Nursing practice discussed, made it essential that short statements were not divorced from the whole interview too early. It was

difficult to see how the comparatively complex outcomes could have been evolved through the Marton method.

The decision was taken to adopt the transcript-based Åkerlind method.

4.5.3. A Method for Stage 2 as Well as Stage 1

The results from the Pilot Study allowed the proposed Methods for the study proper to take their final form. They are discussed in the next chapter.

It was decided that Åkerlind's data analysis methods, as well as being adopted for Section 1 of the study looking at the Information Literacy experiences of a sample of nurses, would also be employed in Stage 2 (See Chapter 5). These methods, with their 'Dimensions of Variation' and 'Themes of Expanding Awareness' suggested the possibility of an entirely new way of analysing changes in the range and sophistication of experience.

Chapter 5

Methods and Plan

5.1. Overview

This chapter describes the Study's structure and methods.

A brief summary of the Study is given below before each of the 2 stages is discussed in detail. 5.4. takes a different perspective, that of the 4 Aims.

The final section sets out the original contribution made by the study.

The Project consisted of two Stages:

Stage 1 (Satisfying Aims 1, 2 and 3)

A phenomenographic investigation into the Information Literacy experience and behaviour of nurses, by means of interviews of nurses advertised for through the University and NHS Trusts (Sampling, including sample size is discussed in Section 6.2.). The data was used to describe the parameters of Information Literacy experience in Nurses. These were then used to sketch out the structure and content of an evidence-based Informational Literacy educational intervention.

Stage 2 (Satisfying Aim 4)

A follow-up investigation into changes in the Information Literacy experience of a group of 7 participants from Stage 1 who had undertaken a Nursing Information Literacy module.

Limitations of the Study

This study was limited to nurses currently on the Nursing part of the register maintained by the Nursing and Midwifery Council. This excluded Midwives as belonging to a separate profession.

5.2. Stage 1: How Do Nurses Experience Information Literacy? How Can it be Developed?

Stage 1 satisfies Aims 1, 2 and 3.

5.2.1. Data collection and fieldwork

Fulfilling Aim 1

As described in Chapters 3 and 4, Phenomenography makes use of open-ended, semi-structured interviews, in which participants are asked to describe their information seeking activities. The 41 participants in this study were interviewed at their place of work, at the campus of the University of West London or by hands-free telephone using an interview protocol developed from guidance in the methodological literature, previous studies (such as that of Bruce (1997)) and modified in light of insights from the Pilot Study. The participants were asked to describe their experiences of Information Literacy in the context of their nursing practice. The interviews were recorded.

Greater detail is given in **Chapter 6**

5.2.2. Data Analysis

Fulfilling Aim 2

The Pilot study (Chapter 4) led to the decision that Åkerlind (2005c)'s data analysis methods would be adopted. The final protocol involved an 8 stage process (Section 7.4).

Only 33 of the 41 transcripts were read through at first to prevent 'data overload' (see Section 7.4.1). The 33 were selected entirely at random. 'Similar' transcripts were grouped together after re-reading both the transcripts several times. *Dimensions of Variation* were then sought out and developed. These are the building blocks of the larger structures and are brief statements which describe experiences of an aspect of Information Literacy. In the Åkerlind method, the Dimensions operate in *Themes of Expanding Awareness* – aspects of the phenomenon of which the Dimensions are experiences of varied complexity. Dimensions were grouped under the Themes to show a progression of expanding awareness of that aspect of Information Literacy, expressed as increasing complexity of experience.

Once the remaining 'consultation' transcripts were incorporated, *Categories of Description* were developed by bringing together Dimensions of Variation from each of the 7 Themes at the same level of complexity of experience, and an *Outcome Space* sketched out showing the relationship between the Categories.

Greater Detail in **Chapters 7 and 8**

Fulfilling Aim 3

Once the main findings for Stage 1 were finalised as set out in Chapter 8, Variation Theory was applied to the parameters of Information Literacy in Nursing as described in the form of Categories of Description and Themes of Expanding Awareness, to develop a structure and teaching and learning approach for a future evidence-based Information Literacy Educational Intervention for Nurses.

Greater Detail in **Chapter 9**.

5.3. Stage 2: Analysing the Development of Information Literacy

Satisfying **Aim 4**.

5.3.1. A New Application of Phenomenographic Method

Phenomenography was used in Stage 2 in a way not used before: as an indicator of the range and complexity of Information Literacy experiences before and after an educational intervention. That is, as a way of determining what 'progress' had been made in the participant's Information Literacy capabilities.

Rationale

Dimensions of variation are formulated as part of the Åkerlind data analysis methods (see Sections 3.4.2. and 4.4.2. and most fully in 7.4.3.) chosen as appropriate for this study. Each Dimension is developed across the participant group – a key aspect of the process which makes sure that they and the Categories of Description that are developed from them are representative of the experience of the group.

However, experience in data analysis in Stage 1 showed that although the Dimensions are defined across the group, **when returning to analyse the transcript of each individual participant, some of the previously defined Dimensions can be identified as being present.**

It was reasoned that any participant could therefore be mapped against the parameters of Information Literacy for the group developed from the findings of Stage 1 of the study (or any equivalent study), to give a detailed picture of the range of experiences they are currently capable of. Which Dimensions of

Variation can be detected – and therefore which Themes of Expanding Awareness are strong or weak; which Categories of Description are within the Participant's experience?

It was also reasoned that a further mapping exercise, after an educational intervention, could show any change in the range of experiences of the individual participant and give some idea of the nature and quality of that change. What new Dimensions of Variation can now be detected in the transcript? Which Themes of Expanding Awareness and Categories of Description are strengthened?

Finally, given data from a number of participants, something about the strengths and weaknesses of the intervention could also be determined.

5.3.2. Data Collection and Fieldwork

The second part of the study, therefore, investigated the effect of the University of West London's already existing Information Literacy Module 'SEARCH for Health' on a group of participants: recording any changes in experience of Information Literacy (in the form of new Dimensions of variation) through a second phenomenographic interview.

Participants in Stage 2 were interviewed as part of Stage 1. After completing the module the participants were interviewed again.

5.3.3. Data Analysis

As described above, data analysis in Stage 2 was a comparison between the two Interviews to determine how the experience of Information Literacy has

changed. Such change is detected in the form of Dimensions of Variation present in the second transcript not present in the first.

This comparison was used to address the following questions:

a. What is the effect of the module on the Participant?

- i. How can we describe the effect of the module on the participant by analysing the new Dimensions (or rather sub-dimensions, see Section 8.4) identified in Interview 2 in light of those present in the first interview and those that failed to develop after the module?
- ii. Is the Participant operating at higher 'Categories' after the Information literacy educational intervention?

What can be said about the range and quality of the Participant's experience of Information Literacy after the module in terms of which Themes of Expanding Awareness have or haven't been strengthened, and which Categories of Description have been brought into greater prominence in the Participant's experience?

Similarly:

b. What are the strengths and weaknesses of the module?

- i. To what degree is each Theme of Expanding Awareness strengthened in the Participant group as a whole?
- ii. Which Categories of Description are and are not strengthened in the group?

Greater Detail is given in **Chapters 10, 11 and 12**

5.4. Fulfilling the Aims of the Study

This section looks at The Study Plan from the perspective of the 4 Aims of the study (Section 1.5.)

Each of the 4 Aims was addressed by the following Methods which were performed in the specific part of the Study indicated.

Aim 1

To investigate how being Information Literate is experienced by nurses.

Method: Phenomenographic Interviews with a sample of Nurses adequate to represent Nurses as a whole.

Part of the Study: Stage 1 Data Collection (Chapter 6).

Aim 2

To use the insights obtained to develop a description of the parameters of information literacy in Nursing, including those of its role and value in EBP

Method: Interpretation of the Interview transcripts using Phenomenographic Data Analysis methods based on Åkerlind (2005c).

Part of the Study: Stage 1 Data Analysis (Chapters 7 and 8)

Aim 3

To use the parameters of Information Literacy in Nursing to develop an outline of the structure and content of an evidence-based Information Literacy educational intervention for nurses

Method: Application of Variation Theory to the parameters of Information Literacy as experienced in Nursing (described in Chapter 8) to develop the outline of an intervention.

Part of the Study: Chapter 9.

Aim 4

To analyse the information literacy development process in nurses with a view to practical application and improvement of outcomes.

Method: Second phenomenographic interviews given to a small group of the Stage 1 participants after an Information Literacy educational intervention (SEARCH for Health). An interpretation of the additional experiences recorded in the transcripts, using a method which employs structures of analysis from the Åkerlind protocol not previously used in this way.

Part of the Study: Stage 2 Data Collection, Analysis and Interpretation (Chapters 10, 11 and 12).

5.5. Originality of the Study

Where does the 'originality' of this project lie? In summary:

- For the first time an evidence-based description and understanding of how nurses as a whole experience information Literacy. The first for any evidence-based profession overall.
- The structure and content of the first Information Literacy Intervention for nurses based on research evidence of nurse's actual experience.
- A new means of auditing educational interventions in Information Literacy.
- A new application of Phenomenographic method.

The successful description of the experience of Information Literacy in an evidence-based profession such as nursing, points to the feasibility of similar projects in evidence-based or Information rich professions such as Law, Midwifery and Social Work.

The offer of evidence-based Information Literacy education which can be shown to enrich the quality of the EBP of practitioners, could potentially contribute to an increase in Information Literacy's perceived value and significance within the professions, and encourage more widespread attempts to develop it.

This may lead to greater professional effectiveness and patient/client safety.

Chapter 13 discusses the originality of the study, and the significance of that originality, at length.

**PART 2 - HOW DO NURSES EXPERIENCE
INFORMATION LITERACY? HOW CAN IT BE DEVELOPED?**

Chapter 6

Participants and Data Collection for Stage 1

6.1. Introduction

This chapter introduces Stage 1 of the study. As has been summarised in Chapter 5, this involved an attempt to discover as full a range as possible of experiences of the phenomenon of Information Literacy by nurses. This was achieved by means of analysis of interviews of an appropriate sample based on the epistemological assumptions of Phenomenography.

After completion of the Pilot Study, volunteers were obtained for Stage 1. Sampling, the methods used to obtain the volunteers and the background of the participants are discussed in Section 6.2. Section 6.3 describes the rationale for the final interview protocol and the methods employed in the interviews.

6.2. The Participant Sample

6.2.1. Sampling Rationale

Maximising Variation to Achieve Meaningful Data Saturation

According to Patton (2002) sufficient variation can be achieved for a manageable but also valid sample by using **Maximum Variation Strategy**. This involves studying the potential variants in the population (such as those in 6.2.2. below), and making sure the sample varies as broadly as possible in terms of each. The sample for Stage 1 of the Study consisted of 41 nurses, nurse managers and nursing tutors (all with significant clinical experience) who between them covered as wide a range as possible of experience of different working environments and specialities.

If the sample is as varied in personal and professional criteria as practically possible it can be argued that it is a representative one if **Data Saturation** occurs. *Data Saturation* is achieved when nothing 'new' is being discovered in ongoing processes of data collection, and stability has been maintained. That is, when participants have said nothing original for some time and over several transcripts.

If *Data Saturation* is achieved in such a *Maximally Varied Sample*, then it can also be reasonably assumed that all relevant data has been collected (Åkerlind 2005c).

Sufficient Participants to Achieve Data Saturation

The number of participants in the sample was therefore determined by both Maximum Variation Strategy and Data Saturation (Åkerlind 2005c). As alluded to above, the sample did not need to be a carefully worked out 'average' of the population of nurses: if data saturation is achieved in a maximally varied sample, then it can be reasonably assumed that all relevant variables are represented in the sample. As the interviews progressed, it became clear after about 25 interviews that data saturation was near to being reached. Further interviews were obtained with participants with characteristics in the categories set out in 6.2.2. not yet covered by the sample. By 40 Interviews, when the categories had been covered, no further previously undescribed experiences had come to light for several interviews and so data saturation seemed to have been arrived at. A last minute volunteer made the final total 41. This was quite a large sample for a phenomenographic research study. For experienced and authoritative phenomenographer John Bowden '*most phenomenographers find that between 30 and 40 subjects*' allow '*sufficient variation*' (Bowden 2005, p.17) while avoiding unmanageability.

6.2.2. Characteristics of the Participant Group

Finding the Participants / Ethics

Ethics approval for the study was achieved through the acceptance of the research proposal by the University of West London and the School of Computing and Technology.

Participants were advertised for through NHS R &D departments, through the researcher's contacts in NHS Library services and through students and academics at the University. Posters and e-mail circulars were used and word of mouth through trust employees who were students and tutors at the University.

When necessary, proper application was made through Trust Research and Development departments for permission to interview trust employees, and necessary documents including ethics clearances were submitted and granted (example: Appendix 3).

What is a nurse?

For our purposes a nurse is someone registered on the professional Nursing register managed and maintained by the Nursing and Midwifery Council (NMC). The main parts of the register distinguish between Adult, Child, Mental Health and Learning Disability nurses (NMC 2010c). There is also a 'Specialist community public health nursing' part of the register which recognises those non-hospital based roles such as school nurse.

Sample Variables

Participants ranged widely in terms of several criteria:

- Age (20s to late 50s)
- Professional Experience (1 year to more than 30 years)
- Gender (36 female; 5 male)

- Nursing specialism and role (Asthma; Critical Care; Cancer; Gynaecology; Haemodialysis; HIV/AIDS; Learning Disabilities; Mental Health; Neonatal; Paediatric; Sexual Health; Substance Abuse.)
- Academics; Practice Nurse Educators; Research Nurse; Ward Nurse; Community Nurse; School Nurse.
- Seniority (Trust-wide leads; Matrons; Sisters; Practice Nurse Educators; Staff nurses).
- Location: (Berkshire and West London).
- 'Trust Culture': Trusts and Wards in which research evidence is left to the individual or interdisciplinary team to find and apply, to those in which research-based guidelines are prominent and ad-hoc information gathering is on a smaller, interpersonal scale.
- Variations in the degree of 'EBP' education or other educational experiences (masters; non-masters post-qualification courses; graduates; HE diploma).

Additional Variation in the Sample: Variation in Levels of Sophistication

Logically, it could be argued that it was particularly important to have a significant number of participants who understood EBP and had experience in working in an evidence-based way to give a rich account of Information Literacy experience. And, in addition, there should be a significant number of participants with significant and well-practiced information skills, who were therefore likely to have complex and varying experiences. Without these it would not be possible to give an account of the experience of Information Literacy in Nursing. However, the complete description of Information

Literacy in Nursing includes those lacking complex experiences, or rather, those who operate at lower levels of sophistication in their information Literacy experiences for some or most of the time. The nurse who isn't an intense 'EBP enthusiast', but seeks information in her daily work to obtain knowledge, is also significant to the full picture of Nursing Information Literacy experience. Therefore though several participants were highly EBP literate, but many were not.

Variation in the participants' employment locations allowed the sample to vary in a similar way. NHS Trusts had varying cultures of EBP. While some had a vigorous culture in which practice educators encouraged students (and others) to question practice and come to the on-going discussion with their own research evidence, some trusts remained locked into an environment in which evidence-based clinical guidelines were followed, but only as authorities rather than sources of evidence, and nurses 'did as they were told'. However, the latter cultures were seldom as regimented as this suggests and, for instance, informal discussions around circulated journal literature were common as well as 'non research evidence' information seeking and exchange.

Nurses who had had recent educational experiences at university, either as undergraduate, post-qualification specialist course attendees or as Masters students, often showed both a greater awareness of EBP and an appreciation of the value and role of information literacy, even if that was only a desire for the perceived advantages available from improved skills and knowledge. Although this was most frequently encountered in younger nurses, that was not entirely the case; though more experienced nurses

often had a greater awareness of other sources of 'evidence' and information, and a simpler, 'task-based', Information Literacy experience.

Variation in awareness of EBP, and sophistication of Information Literacy experience was also observable across specialisms. Those associated with critical care in particular were very EBP aware and took the attitude that lack of EBP and poor information skills could be judged as professional and ethical failure, as the failure to provide the best possible care could have literally fatal (and legal) consequences. Other specialisms seemed to be more influenced by individual initiative or trust culture.

6.2.3. The Participants

A brief description of the 41 participants in Stage 1 of the study can be found in Appendix 4. Their number identifies the order in which they were interviewed.

6.3. The Phenomenographic Interviews

Participants were contacted via e-mail with an invitation to be interviewed at a place and time of their choosing. A further e-mail shortly before the interview included a more detailed description of the study (Appendix 2) and a copy of the interview protocol.

The interviews took place at a location and at a time convenient to the participant, or via hands-free telephone if a personal meeting was not feasible. The interviews were audio-recorded.

6.3.1. Applicable findings from Pilot study

As described in Chapter 4, the Pilot Study found that the characteristics of a successful phenomenographic Interview were as follows:

- Correct preparation of the Interviewee
- Flexibility in the order and wording of the questions
- Allowing the participant to reflect and direct the path of the interview
- Avoiding the forcing of the interview into areas where the interviewer felt would 'yield' the most interesting comments
- Avoiding assessment of the 'value' of comments and new directions of analysis as the interview progressed

These points reflected closely the advice given by Ashworth and Lucas (2000) as described in Section 3.4.1.

However, it was recognised that the pilot study participants were of a certain type – namely experienced academics. On reflexion it was thought that less

confident, experienced or (professionally) articulate participants may not be as active in directing the interview towards their own experiences and the experiences they valued in the way that the pilot group were able to, or even articulate clearly those thoughts and experiences. In some interviews this proved to be the case, and a delicate balancing act was necessary to maintain maximum participant 'freedom' while not failing to encourage a maximum 'disclosure' of experience.

6.3.2. Rationale for the Final Interview Protocol

As discussed in Chapters 3 and 4, Åkerlind (2005c, p.106) recommends three types of questions in a phenomenographic interview, these were successfully employed in the Pilot Study and therefore the final protocol adopted them as a structural basis and general approach.

Contextual questions which set the scene and encourage the participant to begin to reflect on the context in which they experience the phenomenon.

Primary questions which were of two types. a) Firstly *Open questions*, which allow the participant to gradually narrow the focus and begin discussion of their experiences. And b) *Concrete examples* in which the participant was actively encouraged to describe as many individual experiences as they could.

And *Unstructured follow-up questions* which check on the significance and meanings of earlier statements and encourage further elaboration.

Final Protocol Question Types

Hence, questions in the final protocol moved from the contextual to the more specific, allowing the participant to reflect on the context of their experiences of Information Literacy, then focus on and describe those experiences.

Below is a detailed description of the types of questions used in the general order in which they appeared.

1. Questions describing understandings of and attitudes to EBP

These allowed the participant to discuss and reflect on the contexts in which they experience Information Literacy.

As discussed in Chapter 3, the methodology's epistemological claims rest on the idea that obtaining descriptions by the participant of how the phenomenon is experienced in its normal contexts, the contexts in which it has meaning for the participant, is the key to discovering what it means to the participant group. How the participant understands the role of evidence, including non-research based evidence from patient-nurse and team-nurse interaction, must be expanded on before they can describe, and the researcher can grasp, what Information Literacy means to them, that is, what forms of knowledge are recognised as significant to practice. Only then can they, and the researcher, see in what contexts Information Literacy has this significance, this meaning, or this group of meanings within Nursing practice

2. Questions describing how EBP operates in practice - Or more generally, to what end is evidence and other information identified, gathered, and applied in the world of the nurse?

The context described in 1. is brought into a more specific Information Literacy focus. The participant is encouraged to begin to think about research evidence and other clinically relevant information: what it is and how it is applied and why – and how they themselves have done so.

3. What Information Skills are needed to make EBP work or for a contemporary Nurse to function effectively?

What experiences of Information Literacy have been fundamental to the participant's successful practice over time and in varying contexts? The participant is encouraged to reflect deeply on what Information Literacy means.

What happens when the skills are absent?

The 'negative' perspective, reflecting on lack of Information Literacy, allows a slightly different angle to be taken and a different set of experiences to be brought forward. When has the participant or her team/colleagues failed to generate the knowledge needed through lack of information skills; skills that have turned out to be important over time?

4. How do you use your information skills? How and to what end?

How does Information Literacy operate within the participant's own day to day professional life? How do they experience it as an active phenomenon

within their own perceived understanding of their portfolio of professional activities? What are its purposes and so what meanings are given to it? These are not, or rarely, investigated in the form of direct questions. As described in Chapter 3, by asking participants to give concrete examples of how they have found and applied research evidence or other information, narratives of experience and meaning of the phenomenon can be obtained and then analysed to yield a description of experience of the phenomenon under investigation . Asking direct questions about 'information literacy', a concept rarely known or understood by practising nurses, would yield little beyond confused definitions, if anything at all.

Participants were asked to give as many examples as possible to allow experience of Information Literacy to be described in as many ways as will describe the full range of variations. Follow up questions were of the 'why' type to further develop descriptions of meaning.

5. What are the implications of effective Information use? How does it change and inform practice. How does it affect relationships with colleagues and patients?

How does the participant 'world' Information Literacy within clinical practice and beyond the immediate context of that practice? That is, how do they experience it as part of a broader interconnected context one which extends to patients, family and the wider society?

6.3.3. The Interview Protocol

Connaway and Powell's (2010) discussion of data collection methods in Information and Library contexts identifies less structured interviews as better for analysing 'perceptions, attitudes and motivation' (Connaway and Powell 2010, p.173). All aspects relevant to investigations of experience.

Lightly structured interview protocols, through which descriptions of experiences are sought through open-ended loosely ordered questions, are also to be found in the phenomenological literature. Fackler et al (2015) used 1-hr semi-structured interviews based on protocols of this type to allow nurses to talk freely and in detail about their lived experience of power. Cope and Sanabria (2014) analysed a university faculty's perception of Information Literacy in order to determine its fundamental meaning for the group. Both studies highlight the need for a sufficiently focused but flexible interview to allow the full range and complexity of experiences of the phenomenon by the participants to be described.

The Pilot Study interview protocol (Section 4.3.1.) based on Ashworth and Lucas's (2000) guidelines and the Åkerlind (2005c) question types as discussed in Section 3.4.2. as well as comments in Marton (1988), Bowden (2005) and Åkerlind et al (2005) was modified in light of the experience of the Pilot Study interviews, and again after each of the first 4 interviews of Stage 1. Each early interview was carefully assessed for richness of response and engagement of the interviewee and the protocol was modified based on what appeared to work. However, the modifications were minor.

The final protocol can be found in Appendix 5

This wasn't, as has been emphasised earlier, a strict protocol. However it was used by the interviewer as a guide to the areas to be 'covered'. Most frequently the related topics and issues evolved 'naturally' as the interview progressed. In few instances was the protocol a simple outline of the interview as it happened.

In summary, the Interview protocol allowed participants to:

1. Contextualise experience (for themselves and the interviewer)
2. Describe experience of the phenomenon within its context
3. Show how the phenomenon is part of their broader 'world'.

6.3.4 The Interviews

Before the Interview

Participants were put at ease and the general subject and purpose of the interview was repeated. Although the Interview protocol was sent to the participants at the time of their agreeing to be involved, many had only briefly scanned it and hadn't developed a good grasp of the content, purpose of the project or the nature of the phenomenographic interview. As already briefly mentioned, it was necessary to preface the interview itself with a descriptive overview of these key factors. This was general enough to avoid biasing the interview but specific enough to allow participants to avoid a feeling at interview of confusion and allowed them to more easily contextualize their responses (Ashworth and Lucas 2000, Point 1). As the phenomenographic interview technique places great onus on the participants' own life-world

directing the flow of the interview, the participant must begin by feeling that they understand what the interview is for and about in order for thoughts and memories to crystalize and expand. As has already been mentioned, use of the term 'Information Literacy' was often abandoned in favour of 'information skills' or 'finding and using of research evidence' as being more familiar and meaningful for the participant.

Participants were reminded that they should feel free to direct the interview themselves, include anything they felt relevant, and not to feel that the interviewer was 'not interested' in something they felt may be pertinent.

Listening

Listening skills were essential in conducting the interviews. A parroting of the protocol would result in a disjointed interview and a confused and irritated participant. Getting the participant to reveal their life-world required the interviewer to become absorbed in that gradually revealed world so that any intervention pushed the participant on into further related thought and memory rather than create confusion from an 'external' reflection, one alien to the life-world as it was emerging in the reflections thought patterns of the participant. This was not easy. The pilot study had shown the danger of making a mid-interview assessment of its direction, especially if pre-conceived notions led the interviewer to believe that the discussion had strayed into 'irrelevant' areas. Instead, the interviewer attempted to 'think in' to the life-world when this happened in order to avoid alienation from the latter; an alienation which would quickly stunt or derail the interview.

Follow-up Questions

Follow-up questions evolved into two kinds: those that pushed the participant to expand their thoughts and memories (the kind recommended by Akerlind), and those that, once such an expansion had exhausted itself, moved on to other areas highlighted in the protocol, related as naturally as possible to the previous 'topic'. It proved difficult at times to avoid the 'summarising' question in which the interviewer attempts to put the thoughts of the interviewee into his own words. However, if this resulted in strong agreement and further developing thoughts from the interviewee then it could be said to have an acceptable positive consequence beyond concerns about 'putting thoughts into the participant's mouth'. Similarly, 'don't you agree' could also be valuable only if it produced a similar response.

Promoting Validity in the Data: 'Bracketing'

As discussed in Chapter 3, Bracketing is essential to prevent the contamination of the expressed life-world of the participant. Bracketing involves the active awareness of and avoidance by the interviewer of factors likely to contaminate the responses of the participant thereby preventing a true expression of her or his experiences and life-world. Ashworth and Lucas claim Bracketing originated in Husserl who developed it to prevent 'theories, research presuppositions, ready-made theories' (Ashworth and Lucas 1998, p.418) 'contaminating' real, lived experience.

Ashworth and Lucas (1998) categorise into two broad types. The discussion below describes how bracketing of both types was attempted.

a. *Science*

i.e. previously unknown (to the participant) facts or findings from other studies. In this study, technical terms such as 'Information Literacy' were dropped if the interviewee was unfamiliar with them. Interviews didn't begin with a list of 'definitions of key terms likely to be used', but it was necessary to deconstruct unfamiliar jargon in a natural way in the course of the interview. This was to make sure that experiences were expressed in terms familiar to the participant – without the participant having to struggle to include terms half understood but presented as the 'key' ones by the attitude of the interviewer.

Although EBP was understood by all, its implications were subjective; no 'definition' was offered by the interviewer. It was also important not to impose definitions of 'information skills', or 'information use' by making questions too specific to context and example.

It was very difficult not to begin interventions with 'others have said' or 'the literature seems to suggest'. It is a 'natural' way to encourage participants to describe similar experiences if they have had them – however such a statement, it soon became clear, was a 'contamination'; some personality types may be encouraged to agree or mould experiences to fit the template offered as a way of pleasing the interviewer. Although nurses usually have stronger personalities than this!

The Pilot Study was a potential source of distorting data. Basing interventions in the interviews on what had already been discovered in it had to be guarded against carefully. Although the protocol was altered based on

what was found to encourage participants to discuss and describe their experiences and conceptions of Information Literacy, it was not modified based on the draft Categories of Description. Truthfully, though, some of the intellectual content from the categories did find its way into some follow-up questions in some interviews.

b. Querying the validity of the life-world

As the Pilot Study showed clearly, the apparent irrelevance of responses or directions in which the participant 'took' the interview were relevant to their life-world, if not to the researcher's. This continued to be an issue as the main part of the study got underway. Although the 'trigger questions' were used in the interview, the order, form or completeness of the questions was based as much as possible on the emerging 'life-world'.

The interviewer attempted to:

- i. avoid 'directing the interview' or 'structuring' it rigidly
 - ii. avoid cutting off the flow of the interviewees thoughts due to perceptions of 'irrelevance'
 - iii. avoid follow-up questions which made some experiences seem more 'important' than others.
 - iv. avoid expressing his own ideas of Nursing, Information Literacy and EBP in follow-up questions or remarks - easier in Nursing and EBP than Information Literacy (the researcher not being a nurse but being involved in Information Literacy teaching) - as certain ideas are held strongly.
- However a key motive for this study is the strong belief that librarian-derived ideas of Information Literacy are not necessarily as valuable and

appropriate as librarians think. A motive that proved to be helpful, especially in this context!

‘Attempt’ proved to be the operative word, as some of these proved to be easier to achieve than others; and varied in success between interviews.

6.4. Summary

After the 41 interviews were complete, they were transcribed word-for-word and the analysis process begun. Chapter 7 describes the data analysis process as it was undertaken, based on the phenomenographic methods described in Chapters 3, 4 and 5.

Chapter 7

Analysing the Data from Stage 1

7.1. Introduction

This chapter describes in detail the methods used to analyse the data from Stage 1 of the study: the 41 phenomenographic Interviews described in Chapter 6.

Data analysis methods in Phenomenography were described in Section 3.4.2. Chapter 4 described the work done in the Pilot Study to determine which method, of the two schools of analysis, would be appropriate for this study. The method described by Åkerlind (2005c), itself a summary of what she and her colleagues regarded at best practice, was selected for reasons given in that Chapter and summarized in Section 7.3. below.

Use of Analysis Software

As Crowley et al (2002) point out, qualitative data is not well suited to analysis by software package, due to the complexity of the processes of its interpretation. It was felt that this was particularly true of the Åkerlind method involving (see Section 7.4.3.) as it does the building of representational statements of experience through methods which rely on a more subtle process than the simple coding of words and phrases.

7.2. Transcription of the Interviews

The first stage in the analysis process was the transcription of the 41 interviews. Dertins (2002) emphasises that the transcription process is one in which the 'interviewer' is transformed from a subjective participant to an objective 'data analyser'. This involves the decontextualizing of the 'conversation context' and an emphasis on the content as objectively analysable 'data'. The ease in which this can be done depends on the directional presence of the interviewer, which is deliberately weak in the phenomenographic approach. If the interview was one which allowed the interviewee to successfully explore their own concepts and experiences in depth, under their own momentum directed by their own perception of interest and significance, as Phenomenography requires, then this should allow the interviewee to more easily become an objective analyst.

The researcher must now concentrate on the text. As the pilot study showed, the immediate perception of the interviewer as to significance (or lack of significance) was entirely misleading.

Each interview was recorded and then transcribed word for word; those for Participants 1 to 7 by the researcher, the remainder by a professional transcriber. The 'rough transcripts' produced by the latter were compared carefully by the researcher to the original recording of the interview and emendations made as necessary, including when necessary marks of emphasis.

Due to mechanical failure, the transcripts of Participants 10, 11 and 37 were incomplete, but supplemented by detailed immediate recording of as many

of the participant's responses as could be recalled. In all three cases that proved to be of sufficient number for the 'transcript' to be included. This gives a potential source of inaccuracy. However because transcripts function as 'confirmation' (or not) of others' experience of phenomena, not independent data units, the likelihood of falsity being introduced into the data is greatly reduced. If misremembered 'false' experience is not built on or confirmed by other participants it will not find a place in the final outcome.

Were 'Affective Contexts' Worth Recording in Interview Transcription?

Hazel et al (1997) note the absence of emotional descriptors in phenomenographic outcome spaces. This may be due to the subject areas commonly investigated by this method; perhaps those in which experiences involve emotional responses are not common. In this study, participants often discussed their clinical practice and the role that finding and using research evidence to improve it, in tones of voice which indicated satisfaction, elation and sometimes frustration. However, the text itself usually 'described' these feelings and the researcher only occasionally felt that text as transcribed was inadequate to the feeling involved. Perhaps research into more profoundly personal issues which may lead to intensely emotional but comparatively inarticulate responses would cause greater difficulty. The difficult question whether emotion can convey experience separately from words, and how this was to be incorporated in a methodology in which the text of interviews is analysed, deconstructed and compared was fortunately not one which had to be addressed.

7.3. Applicable Findings From the Pilot Study

As described in Chapter 4, analysis of the interviews for the pilot study appeared to show that the relationship between information literacy and EBP was complex. The experiences described could only be mapped across a whole interview and could not usually be expressed in the form of a single phrase or sentence from the transcript. The slowly developing and frequently context-modifying descriptions of how Information Literacy was experienced and understood through the many elements of EBP theory and practice, made it essential that short statements were not divorced from the whole interview too early. Perhaps because Information Literacy was always seen in the EBP context, an understanding/ experience was not always vividly in focus in one 'location' within the transcript, but became so over the whole interview. In addition, because Information use was not usually at the forefront of a nurse's thought about her practice, her experiences of the phenomenon of Information Literacy came out gradually in the form of discussions in which Information use was not always in sharp focus.

In the pilot study, stage 1 of the analysis process:

Read though each transcript three times, on the third reading making notes on each, summarising key 'issues and themes' emerging in the context of the others.

showed that reading the transcripts twice, at least, before making notes should be strictly adhered to. This seemed to be because:

- a) The significance of individual statements was seen in clearer, or different, focus with a good and thorough knowledge of the whole transcript
- b) The relationship between the Information Literacy and EBP often seemed to result in an interview in which the participant needed to 'come back

around again'. This seemed to be to allow the participant to further develop the description of an experience, something which also involved bringing together widely 'located' previous comments.

This appears to confirm the validity for this study of the key principles of the 'Åkerlind' method.

The **Åkerlind method**, by recognising the transcript as an entity, if not an isolated one, through the whole analysis process; thereby encouraging reading across many parts of a transcript while at the same time not concentrating on one transcript inappropriately; was the method which addressed the issues above.

Based on these strengths, which often contrasted with the Marton method's corresponding limitations, **it was decided to adopt the Åkerlind method (Åkerlind 2005c) as the data analysis method for this study.**

7.4. The Data Analysis Process

Having determined from the pilot study, therefore, that Åkerlind's method would be used as a basis for analysis, the following protocol was followed (Åkerlind (2005c).

7.4.1. Step 1. Reading Through the Transcripts

A read-through of 33 of the 41 transcripts to become as thoroughly aware of their contents as possible.

33 of the 41 transcripts were read carefully three times each, on the third reading notes were made on each one, summarising key 'issues and themes' which seemed to be prominent.

Each reading began the key process of developing deep familiarity with each transcript. Deeper familiarity allows Stage 2 (below) to occur effectively and also assists in the development of 'accurate' Dimensions of variation. The Åkerlind data analysis method requires the whole interview to be taken into consideration in the latter process – thereby implying the necessity of a complete familiarity.

Åkerlind emphasises the necessity of avoiding potential confusion by attempting to deal with all the transcripts at once. It would be difficult to achieve the necessary familiarity if there were to be too many transcripts. Trigwell (1994), Dahlgren (1995) and Åkerlind (2005c) suggest working with only part of the sample at first. In addition to helping avoid confusion in the analyser this can also prevent premature formulations, as will be discussed below. 8 transcripts were therefore set aside for Step 6.

7.4.2. Step 2. Grouping the Transcripts by Theme

Transcripts were grouped together, based on similarity of general theme, after re-reading both the transcripts and the notes repeatedly.

This process also contributed to the development of Dimensions of Variation, which must be developed from analysis across several Transcripts, not just one. The grouping of the transcripts was based on what could be perceived as general 'themes' or 'contexts' for the described experiences of Information Literacy as they emerged during the read through in Step 1. Although Åkerlind indicates that she usually did this by physically grouping the transcripts, this proved to be impossible as each transcript had several broad themes. A roughed out 'diagram' was used for this purpose in which any transcript potentially found itself in several different themed groups.

7.4.3. Step 3. Dimensions of Variation in Awareness

Dimensions of Variation in Awareness of Information Literacy were looked for within the groups.

'Dimensions of variation [are] aspects of the individual's experience of something' (Marton and Booth 1997, p.209). Åkerlind defines them as simple statements describing different experiences of different aspects of the phenomenon, '*referred to in some transcripts but not in others*' (Åkerlind 2005c p.122).

Dimensions of Variation of Experience represent *variation of awareness* of the phenomenon, variation in the ability to experience the complexities or potentialities of a particular aspect of the phenomenon (Åkerlind 2008).

Some Dimensions describe a basic experience (of a more limited grasp of an aspect of the phenomenon) and others a more complex one which is more 'aware' of the complexities of that aspect of the phenomenon. Hence each aspect of the phenomenon is described as a *Theme of Expanding Awareness*.

Dimensions of Variation are developed not just from a simple statement in one transcript, but through a process that simultaneously analyses experience within the transcript and some or all of the other transcripts in the 'themed group'; the 'similarity' of transcripts in the group, in terms of aspects of the Information Literacy phenomenon determinable, making this easier.

The Dimensions of Variation were developed in two stages:

Stage a.

The careful analysis of each transcript began with the identification of statements which seemed to describe or suggest an aspect of Information Literacy experience. These were labelled by means of brief descriptive identifiers. This began the process of developing the Dimensions of Variation but also facilitated the establishment of links in meaning and significance to other apparently related statements elsewhere in the transcript. This latter was a more complex process than simply looking for similarities of phrasing; it involved seeking expressions which seemed to describe a further development or modification of the original experience. If such expressions were found, the descriptive identifier was modified accordingly.

Anything which seemed to be an aspect of experience of Information Literacy expressed across one transcript was searched for in others; if traced in other transcripts then the process of developing a common expression from the descriptive identifier that became the Dimension of Variation was continued across all transcripts of the themed group.

Example: The Dimension *Developing an evidence-based ward culture* evolved, to begin with, from descriptions of experiences involving the location and application of research evidence motivated by a sense of professionalism and conviction. Elsewhere, both within the same transcript and in others, this was further developed by some participants in discussions of the need for the wider adoption of such attitudes within the profession; of how they encouraged colleagues to use research evidence and think in an evidence-based way; and how they themselves have contributed to EBP's entrenchment within their Team and Ward.

Once a dimension had been sketched out, its form was modified on repeated reading and analysis within the themed group of transcripts. This 'iterative' process is key to validity (Åkerlind et al 2005). The remaining transcripts outside the group were then analysed to determine if the Dimension was present. Once the Dimension had been given its final form, the 'presence' of the dimension in any transcript was then recorded to indicate its prevalence.

Stage b.

It became clear that some of the 70 dimensions identified in stage a were close enough in meaning to be grouped together under more generic

descriptions, thereby reducing the total to 42. These generic dimensions retained the original dimensions as 'sub-dimensions'. For example:

- Developing trust in others
- Being seen to be accountable for actions
- Being given autonomy and status within the team

Were grouped under the generic dimension:

- *Information Literacy experienced in successfully developing the trust of patients, families and colleagues*

This helped in the later stages of the analysis process, where a smaller number of more generic dimensions allowed further structures from which they were developed to be seen more clearly. There was no intention to 'abandon' these 'sub-dimensions' derived directly from the data, and they would retain a place in the structures to follow.

In order to prevent a feeling of discontinuity, it seemed appropriate to rename even those original Dimensions which couldn't be grouped under broader headings with a more generalised name.

7.4.4. Step 4. Themes of Expanding Awareness

Grouping of the Dimensions of Variation under Themes of Expanding Awareness of Information Literacy

A Theme of Expanding Awareness represents an aspect of the phenomenon under investigation. In practical terms it is a context or field of operation in which participants experience the phenomenon in their Life-world. A context

in which Information Literacy is experienced which runs throughout the set of transcripts as a whole, and in which Dimensions of Variation can be meaningfully and logically grouped in order to show variation of awareness of that aspect of the phenomenon. (Åkerlind 2005c).

For a Theme to be acceptable it must have logical and empirical justification (Åkerlind 2005c). It must be something under which Dimensions could be grouped to exhibit expanding awareness (logical) and must be meaningful in terms of the experiences described in the transcripts (empirical).

Beginning with the rough Themes generated in Step 2 (Section 7.4.2.), after a continuous process of redrafting of Themes and regrouping of Dimensions under them, the Dimensions of Variation were placed under the Theme which seemed to describe the aspect of Information Literacy they were an experience of. For example, *Information Literacy experienced in successfully developing the trust of patients, families and colleagues* mentioned above, was placed under the Theme: *Information Literacy experienced in development and maintenance of Relationships with patients, patients' families, colleagues and other professionals*. 7 Themes could be defined.

7.4.5. Step 5. The Relationship Between the Dimensions in Each Theme

The arrangement of the Dimensions of Variations in each Theme to show a progression of expanding awareness of variation.

'Themes of Expanding Awareness.....represent...structural groupings of Dimensions of Variation, highlighting the structural relationships between different Dimensions' (Åkerlind 2005c, p.122).

The Dimensions were arranged within each Theme from '*more limited to more expansive aims, processes, outcomes, feelings and purposes*' (Åkerlind 2005d, p.152) showing an increasing 'sophistication' in the experience, or 'awareness', of that aspect of the phenomenon (Åkerlind 2008) described in the form of the Theme – an increasing awareness of its complexity and potentiality – in the context of this study, its potential for initiation of ever more complex knowledge and 'wisdom' (re: Section 1.1)

This awareness ranged from the experience of a simple process to an often philosophical or transcendent understanding. E.g. The dimensions gathered under Theme 3: Information Literacy experienced through its role in helping to achieve 'Best Practice', could be arranged from the narrower focus of finding information on the sociocultural background of an individual patient through to the breadth and complexity of the development of a vision of ethically defensible care.

7.4.6. Step 6. Incorporation of the Remaining Transcripts

The remaining 'consultation' transcripts were incorporated

'After a set of tentative dimensions of variation and categories of description emerged from the preliminary analysis the remaining transcripts were then intensively consulted.' (Åkerlind 2005c, p.117)

The process does not begin again but nor are the tentative formulations and the 'new' transcripts seen as being 'separate from each other.'

This process had the following positive functions beyond the solution to the data overload problem mentioned above:

- i. The dimensions and themes could be looked at afresh. A two stage process allowed a pause to see what had been accomplished; this led to a focussed and more intense engagement with the additional transcripts.
- ii. It challenged the dimensions and themes, and prevents premature formulations by presenting fresh data.

7.4.7. Step 7. Categories of Description

Development of Categories of Description: representative conceptions, or experienced meanings, of Information Literacy

‘Each category of description represents a unique combination of different levels or ‘dimensions of variation’, along each theme of awareness.’

(Åkerlind 2005e, p.19)

The Categories of Description bring together for each level of awareness, the experience of all aspects of the phenomenon into one description. Each Category is a description of what it means for nurses to experience Information Literacy at that particular level of ‘awareness’ of its potentialities in the creation of knowledge and ‘wisdom’. And because it brings together the Dimensions at that level from all the aspects (Themes) of the phenomenon, it is an (archetypal) description of experience of the phenomenon as a whole.

Each Category was therefore constructed by bringing together 7 Dimensions of Variation, one from each of the Themes of Expanding Awareness.

For example, Category A contains all 7 Dimensions from the lowest level of awareness within each Theme (Dimension A in each Theme – See Section 8.5. below), Category B from the next level (Dimension B in each Theme) etc. This gave a logical structure to the Categories recommended by Åkerlind (Åkerlind 2005d).

6 Categories were developed (described in Section 8.6.)

Figure 7.4. The relationship between Dimensions of Variation; Themes of Expanding Awareness and Categories of Description

Expanding Awareness ↓	Themes of Expanding Awareness							Categories of Description A B C D E F
	1	2	3	4	5	6	7	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	

7.4.8. Step 8. The Outcome Space

The final stage is the development of an Outcome Space relating the Categories of Description together to produce a complete picture of the experience of the phenomenon by the representative group.

The Categories of Description brought together for each level of awareness all contexts of experience into one description. The Outcome Space completed the picture by bringing all of the Categories into relation with each

other to produce a picture of all contexts of experience and levels of awareness of the phenomenon. Outcome Spaces '*represent the full range of possible ways of experiencing the phenomenon*' (Åkerlind 2005a, p.323)

As described in Chapter 3, Walsh (1994) defines two approaches to creating Outcome Spaces: 'logical' and 'empirical'. The logical approach attempts to create relationships between the categories which have a clear logical meaning. The empirical approach is more wary of interpretation, concentrating on the data itself. Marton and Booth's (1997) three criteria for judging the quality of a phenomenographic outcome space:

- i. that each category in the outcome space reveals something distinctive about a way of understanding the phenomenon;
- ii. that the categories are logically related, typically as a hierarchy of structurally inclusive relationships; and
- iii. that the outcomes are parsimonious—i.e. that the critical variation in experience observed in the data be represented by a set of as few categories as possible

suggest a Logical approach with a sensitivity to the data but with an awareness of the value of coherency - a combination of the Logical and Empirical approaches. This study attempted just such a combination. This was helped by the logical and empirical nature of the Themes of Expanding Awareness as already described above. The simplest relationship between the categories seemed to be the most logical, empirical and parsimonious: a linear relationship from least to greatest awareness of the phenomenon.

7.5. Summary

Having completed the data analysis process the following had been obtained:

- 70 sub-dimensions of Variation
- These had been grouped into 42 more generic Dimensions of Variation
- These had been grouped into 7 Themes of Expanding Awareness and arranged in 'expanding awareness' of the phenomenon, i.e. increasing sophistication of experience. There were 6 Dimensions per Theme.
- From each Theme a Dimension at the same level of sophistication was taken to create 6 Categories of Description.
- The Categories of Description were brought into relationship to create an Outcome Space

The details of these findings are given in the next chapter.

Chapter 8

Stage 1 Findings: The Parameters of Information Literacy in Nursing Practice

8.1. Introduction and Summary

This chapter describes the findings from Stage 1 of the study.

The Chapter begins with a brief background section reporting on themes emerging from the interviews for purely contextual purposes, before moving on to give the Dimensions of Variation, Themes of Expanding Awareness, Categories of Description (including their internal structure in terms of noematic and noetic aspects of experience) and the Outcome Space which were derived from the analysis processes described in Section 7.4.

The chapter goes on to describe the methods used to check for validity and reliability in the findings in the context of the development of the Categories of Description.

8.2 Points of General Interest from the Interviews

These comments are from the Interviewer's perspective and are only offered to give the findings a general context, without making claims as 'data'.

Culture of the Trust and Ward

Ward cultures ranged from the highly regulated to those which emphasised individual initiative/group work. This often seems related to the nature of the treated illnesses. Critical care environments, dealing with extremely ill and vulnerable patients may be wary of innovation not sanctioned at the highest level for patient safety reasons. However, some Critical Care wards encourage nurses to be part of an evidence-aware team and to bring suggested changes to practice, based on their own evidence searches.

Trusts varied between those in which EBP is seen as central, is widely discussed and has become an 'inspiration' for a wide range of initiatives, and those in which EBP almost seems irrelevant or something imposed and regarded as 'another box to tick' - satisfied by following clinical guidelines and 'policies' in a mechanical, unreflecting way. However even in the latter wards nurses were seen as responsible for their own practice and expected to have an understanding of the potential role that research evidence has as an agent of change and 'validity' – and to be able to find and apply a range of information sources, individually or as part of a team.

Time Constraints

One of the most frequently repeated comments in the interviews was the problem of time. Nurses often had little time to think about the information

they needed, or would find useful, never mind plan and execute a search or gather, critique and apply the relevant research evidence 'out there'. Despite this, many tried, especially those in leadership positions where it was part of their perceived role to keep their juniors informed. Many refused to let their enthusiasm for EBP be diminished by the inability of many trusts to make it more than, as they saw it, a buzz-phrase. The enthusiastic evidence-based practitioners often used their own time to keep up with research evidence. They were happy to do this and regarded it as being part of professional responsibility. They were often unsympathetic to those who claimed they had no time: this was felt to be an excuse used by those who had little interest in doing more than the 'basic' job. Again, despite these variations, it was clear that nurses of whatever level and attitude found and used information of many types throughout their work day.

Variations in Understanding of 'EBP'

In many places 'raw' EBP, in which all practice was directed by unmediated evidence and nothing else, has been adjusted to a more subtle interplay of evidence, mediated evidence (e.g. clinical guidelines) and experience-informed judgement. EBP is often:

- A means of integrating experience and evidence and other information
- Evidence contextualised through judgement of the specific clinical circumstance and the unique circumstances of any individual patient
- Conversely, judgement of the unique context of the patient informed or adjusted by an understanding of the evidence.

8.3. 'Sub-Dimensions' of Variation in Awareness

Analysis of the 41 interview transcripts yielded 70 Dimensions of Variation of awareness of an aspect of Information Literacy. Each, as discussed in earlier chapters, is a description of an experience of an aspect of Information Literacy at a particular level of complexity.

After initial reading through and grouping of transcripts as described in Sections 7.4.1. and 7.4.2., these were derived from following **Step a.** as described in **Section 7.4.3.**

The 70 dimensions are listed below. Table 8.3. describes them as 'sub-dimensions' (as they will be referred to from now on) due to their grouping into 42 broader dimensions as described in step b. and as discussed in Section 8.4 below.

Why No Quotations?

It may be thought helpful for quotations to be given as descriptive examples when interpretations are developed from interview or questionnaire data.

However as indicated in the Pilot Study, the Åkerlind method of data analysis which has been adopted for the study, is firmly against the reduction of transcripts to small quotations; the final dimensions of variation are developed from within the whole experience of the participant and the participant group. It is the assertion of the researcher that quotations would therefore be misleading.

Thinking About Stage 2

Although each Dimension's final form was determined by analysis across the transcripts, **it was possible to identify after re-reading the transcripts which Dimensions could be traced in each.** The Participants in whose transcripts each sub-dimension could be traced are listed in the column to its right. **This latter information is required in Stage 2**, when second interview transcripts are analysed to determine which new Sub-dimensions can be traced after an Information Literacy educational intervention.

Table 8.3. The 70 'sub-dimensions' of variation of awareness of an aspect of Information Literacy as experienced in Nursing:

Information Literacy experienced in.....	Could be traced after re-reading, in Transcript of Participant No:
1. Investigating newly encountered clinical conditions/situations	1,2,13,14,15,16,18,23,26,28, 30,31,33,34,35,36, 38,40,41
2. Establishing knowledge of, and understanding of, current practice and associate issues	2,5,6,8,9,10,11,13,14,15,16, 17,18,19,21,23,24,25,28,29 33,34,35,41
3. Showing competence in day to day work	1,4,6,10,11,13,15,16,18,34 35,36,40
4. Feeling confident in one's role	1,4,5,6,7,9,12,15,16,19,20, 24, 26,27,28,32,35,38,41

5. Progressing professionally. Becoming a Lifelong learner	1,4,8,12,14,16,20,22,23,27, 28,30,33,34,35,37,38,41
6. Becoming an adaptable, flexible and responsive professional	3,5,7,9,13,14,17,25,26, 30,31,37
7. Becoming able to function non- dependently within the team	1,3,5,6,9,11,12,13,14,15,16, 17,18,19,20,27,28,30,31, 32,33,34,36,37
8. Becoming innovative in practice	2,5,6,7,14,26,33,36,37,38
9. Developing a wider professional horizon	1,2,3,5,14,15,17,18,20,32
10. Receiving information from patients, colleagues and other professionals	7,8,10,11,16,24,25,28, 33,36,38,39,41
11. Sharing information with patients, colleagues and other professionals	2,13,17,18,20,22,24,26, 28,29,30,31,32,33,34,36, 39,40,41
12. Functioning as part of the multi- disciplinary team	1,2,6,7,8,9,12,13,14,15, 16,17,18,19,20,22,23,25, 26,27,28,30,31,34,35,36, 38,39,40,41
13. Creating trust in you in others	6,7,8,9,11,13,15,16,17,19, 20,22,23,25,26,28,29,30, 32,33,34,36,37,38,39,40,41
14. Being seen to be accountable for actions	5,6,9,11,15,16,23,28,35

15. Achieving autonomy and status within the team	1,5,8,19,23,29,30,35
16. Functioning as a teacher for junior colleagues and other members of the team	5,12,13,15,16,18,19,22,31,32,33,36,39,40,41
17. Become a patient advocate	6,7,8,12,13,15,17,20,22,23,27,29,32,33,34,35,3638,39,40
18. Fulfil a leadership role within the team	3,13,14,15,19,26,31,32,34,36,40
19. Obtaining sufficient background psychosociocultural background knowledge on a patient	1,4,12,23,25,26,32,36,38,40
20. Contributing evidence and other information to the Multidisciplinary team.	2,4,5,6,8,9,12,13,20,22,25,27,28,30,32,34,36,40,41
21. Determining the most cost-effective/efficient treatment option	20,33,39
22. Attempting to improve individual outcomes	1,5,6,8,21,32,33,34,35,36,38,39,40
23. Attempting to 'improve my practice'	1,3,4,8,14,17,19,27,3233,36,39
24. Developing up-to-date- practice	1,3,4,9,16,18,20,21,22,23,24,2528,29,30,31,33,39,40,41
25. Developing objectively proven/justifiable best practice	1,7,8,9,12,16,17,20,23,24,27,31,33,34,35,36,37,39,41

26. Suggesting a change in practice	3,6,7,17,19,30,33,37,39
27. Developing rationales for change	2,4,6,8,9,13,15,17,18, 19,26,28,34,38
28. Developing a culture of change within the ward	1,3,4,5,6,7,8,9,14,15,16,17,19, 30,31,32,33,35,36,37,41
29. Developing a culture of accountability to patients	1,3,11,15,25,27,28
30. Developing an evidence-based ward culture	1,3,5,7,13,14,16,19,37
31. Exploring the parameters of compassionate care	1,6,7,8,19,25,26,28,29, 32,33,34,36,38
32. Facilitating patient safety	1,3,4,8,9,12,13,15,18,19,20,21, 22,23,25,27,28,29,33,34,39
33. Achieving optimum and so ethically defensible care	6,8,12,13,14,19,26,27,28,35,36
34. Following guidelines, protocols and policy documents	6,7,8,10,16,18,19,20,27, 28,29,31,33,34,36,38,40
35. Matching evidence to a very specific clinical context or specific patient	2,6,7,9,13,15,16,19,24, 25,27,29,32,33,35,36, 38,39,40
36. Using evidence to prompt additional, more detailed questions	8,13,16,17,26,28,30,37, 38,41
37. Keeping up to date with the current evidence relevant to your job	8,9,12,16,20,21,25,37,40,41

38. Contextualizing of evidence by judgement and knowledge / Allowing judgement and knowledge to evolve in light of awareness of evidence	3,7,8,12,16,25,26, 28,29,33,34,39
39. Allowing a scientific basis for practice	2,15,16,17,33,38
40. Allowing an objective, evidentiary underpinning for practice	2,8,9,12,13,16,17,18,20,32,33, 35
41. Auditing practice	5,6,9,12,14,15,20,21,26, 28,29,30,35,39
42. Developing of protocols and guidelines	3,5,7,8,15,17,20,22,29,37,39
43. Allowing experience and evidence to create an integrated mutually informing basis for practice	7,12,16,25,26,28,29
44. Negotiating the technology	1,2,3,7,8,12,15,16,24,25, 28,29,34,36,38,39,41
45. Knowing how to use a library/ Library resource website	1,2,3,14,15,34,36,38,41
46. Practising <u>time efficient</u> information gathering	4,5,7,12,15,16,18,19,22, 23,24,26,27,28,29,30,31, 32,35,38,39
47. Structuring evidence searches effectively	1,6,7,13,15,17,19,24, 25,27,29,30,31,33

48. Finding all or sufficient evidence	2,6,8,9,12,13,14,15,16, 17,20,21,23,26,32,33,39
49. Critiquing relevant evidence effectively	1,5,6,8,9,12,13,14,15,16, 17,19,21,25,26,33,34,37, 38,39,40,41
50. Gathering and applying key information within the ward environment	7,12,20,26,27,31,37
51. Gathering evidence effectively for a team, or group project/guideline development or policy change	6,7,8,15,22,25,27,30,34
52. Having ‘clarity of purpose and action’ when gathering evidence	2,9,14,15,17,25,29, 32,35,36,37,38,40
53. Having knowledge of information types	4,12,19,23,28,33,34,36,38
54. Having knowledge of correct / credible sources/databases	1,3,10,12,13,15,17,20,21, 23,26,27,28,31,32,33,34, 35,36,38,39
55. Having an understanding of the complexities, meanings and structures of medical information and research evidence	6,10,11,17,22,25,26, 27,28,32,33,39
56. Having knowledge of database/ information source structure and functions	10,15,26,36

57. Having knowledge of MeSH subject headings, textwords and how they can be used	2,10,15,17,20,21,24,26,35,36,38,39
58. Having knowledge of the structuring of searches	1,3,10,15,17,20,26,33,36,39
59. Understanding how to respond to an information need	2,3,5,14,17,28,33,35,36,39
60. An experience of information as...Basic clinical and scientific knowledge of a condition	2,4,8,9,10,13,16,20,23,25,26,28,29,31,32,33,35,36,38
61. An experience of information as...Statistical data	2,26,32,38
62. information as...Data generated from patients/ colleagues) and the clinical situation	1,10,11,13,16,26,32,33,38
63. An experience of information as...Clinical guidelines, protocols and care bundles	3,7,10,16,17,18,19,22,27,28,29,31,32,33,34,35,35,37,38,39,40,41
64. An experience of information as...a means of understanding a newly encountered clinical problem or phenomenon	1,2,5,16,26,28,30,31,32,36,38,40,41
65. An experience of information as...A means to enable deeper investigation	5,6,17,26,28,30,35,36

66. An experience of information as...Evidence to inform practice	2,3,4,5,8,9,13,14,15,16,17, 18,20,21,24,32,35,35,36, 37,38,39,41
67. An experience of information as...A means of developing relationships	1,7,8,9,20,22,25,26,29,32, 33,34,36,37,39
68. An experience of information as...Source to develop a guideline protocol or bundle	6,7,8,15,20,37
69. An experience of information as...A means to facilitate change	3,4,5,6,9,12,15,16,17,18, 19,21,32,34,36,37,38,39,41
70. An experience of information as...A means of developing a strategy or theory	3,5,18,29

8.4. Dimensions of Variation in Awareness

This stage followed **Step b.** in **Section 7.4.3.**

Further analysis of the 70 dimensions showed they could be reduced to 42. Although it was felt that each of the 70 dimensions (hereafter referred to as 'sub-dimensions') had their own separate justification and identity, some were so similar they could be grouped and given a general description or definition which covered the group satisfactorily. Others of the 70 could not be grouped in this way but could still be given a more generalised definition to maintain a consistent level of broadness of description.

This procedure made the next step – grouping the dimensions under Themes of Expanding Awareness of the phenomenon more straightforward and produced a clearer and more easily interpretable result – without losing any aspect of the nature or sensitivity of the data or its interpretation.

The 42 dimensions are listed under their associated Themes of Expanding Awareness in the next Section.

8.5. Themes of Expanding Awareness

The 42 Dimensions of variation could be grouped into 7 'Themes of Expanding Awareness' (Åkerlind 2005c).

The derivation of the Themes is described in **Section 7.4.4.**

Themes allow the dimensions to be grouped together to show an expansion of the 'degree of awareness' of the aspect of Information described by that Theme. This is the process described in **Section 7.4.5.**

As described in Section 1.1. Information Literacy is experienced by someone who is aware of, and can perform, the processes which initiate the transformation of data and Information into knowledge and wisdom. Under each Theme it can be seen clearly how the degree of awareness of each of the 7 aspects of the phenomenon of Information Literacy effects the quality of the 'knowledge' or 'wisdom' produced.


The Themes and their associated Dimensions (Identified by letters A-F) and sub-Dimensions (bullet-pointed under their associated Dimension) are listed below.

The expansion of awareness in each Theme progresses from Dimension A through to F and is indicated by means of an associated arrow diagram.

Each Theme is also given a summary and interpretation in which the expansion of awareness is put into descriptive terms.

Table 8.5.1. Theme of Expanding Awareness No.1.

Information Literacy experienced in processes of
Professional Self development


<div>Expanding awareness</div> 	<ul style="list-style-type: none"> A. Seeking out knowledge of clinical contexts and conditions <ul style="list-style-type: none"> • Investigate newly encountered clinical conditions/situations B. Being a knowledgeable nurse <ul style="list-style-type: none"> • Establishing knowledge of, and understanding of, current practice and associate issues C. Achieving professional competence <ul style="list-style-type: none"> • Showing competence in day to day work D. Achieving professional confidence <ul style="list-style-type: none"> • Feeling confident in one's role • Progressing professionally. Becoming a Lifelong learner E. Achieving functional autonomy <ul style="list-style-type: none"> • Becoming an adaptable, flexible and responsive professional • Becoming able to function non-dependently within the team F. Having the ability to think strategically and philosophically <ul style="list-style-type: none"> • Becoming innovative in practice • Developing a wider professional horizon
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Awareness of the potentialities of this aspect of Information Literacy increases from experiencing it in the effective seeking out of knowledge of specific conditions – basic professional activity, to a more complex experience in which Information Literacy contributes to ‘being knowledgeable’. A higher level of awareness still, contributes to the more complex state of ‘competence’.

A still greater level of awareness, ‘Confidence’, can be interpreted here as the root of a developing self-direction: a mid-stage between competence and autonomy. The higher level of ‘autonomy’ is one in which the nurse is able to bring to bear advanced ideas of an ethical/philosophical or strategic kind through a high level of awareness of the complexities of the phenomenon of Information Literacy.

Table 8.5.2. Theme of Expanding Awareness No.2.

Information Literacy experienced in development and maintenance of
Relationships with patients, patients' families, colleagues and other professionals

<div>Expanding awareness</div> 	<p>A. Interacting passively with others –others as a source of information</p> <ul style="list-style-type: none"> • Receiving information from patients, colleagues and other professionals <p>B. Interacting actively – a give and take of information</p> <ul style="list-style-type: none"> • Sharing information with patients, colleagues and other professionals <p>C. Developing functional relationships</p> <ul style="list-style-type: none"> • Functioning as part of the multi-disciplinary team <p>D. Developing the trust of patients, families and colleagues</p> <ul style="list-style-type: none"> • Creating trust in you in others • Being seen to be accountable for actions • Achieving autonomy and status within the team <p>E. Developing a teaching role</p> <ul style="list-style-type: none"> • Functioning as a teacher for junior colleagues and other members of the team <p>F. Developing a leadership role</p> <ul style="list-style-type: none"> • Becoming a patient advocate • Fulfilling a leadership role within the team
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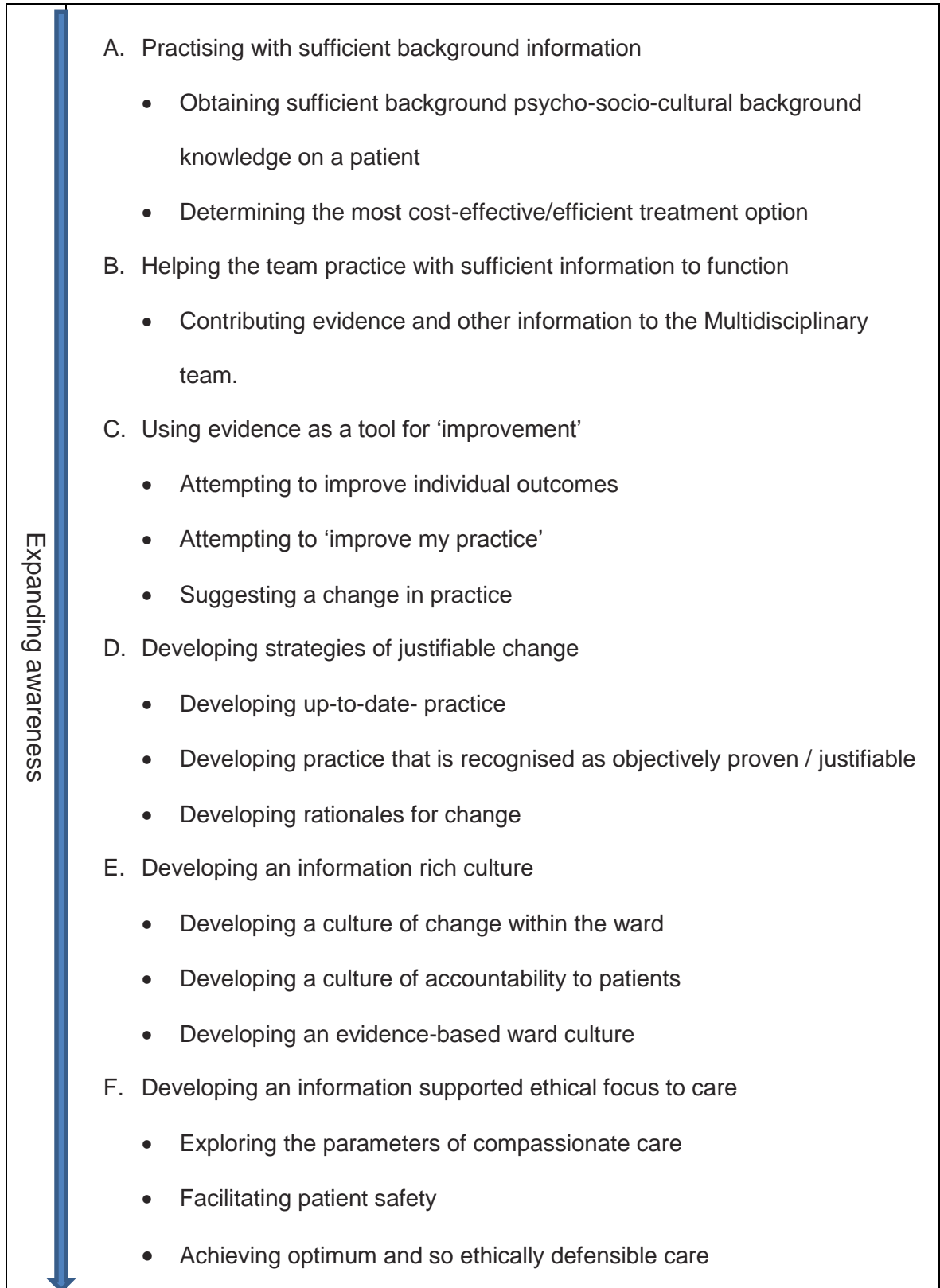
As the experience of this aspect of Information Literacy expands and deepens, it promotes the development of relationships from non-mutual to mutual interactions, which further enriched and stabilised become 'trust'.

Further expansion of the awareness of the complexity of Information Literacy experience enables the nurse to take on a teaching role in relation to fellow nurses and with greater awareness, a leadership role (interpreted as a teaching role of greater depth, breadth and complexity). Information Literacy is experienced as a tool and impetus in the achievement of these roles.

Table 8.5.3. Theme of Expanding Awareness No.3.

Information Literacy experienced through its role in

Helping to achieve 'Best Practice'



Expanding awareness of the potentialities of this aspect of Information

Literacy moves from a simple seeking of sufficient information to function effectively as an individual, to the ability to contribute to the functioning of the team. Awareness expands to involve the creation of strategies for best practice, which leads on to participation in the creation of a culture of achievement.


The stage of highest awareness and most complex experience of Information

Literacy in this Theme operates 'philosophically' in an awareness of the ultimate ethical basis of best practice.

Table 8.5.4. Theme of Expanding Awareness No.4.

Information Literacy experienced within


Understandings and Experiences of EBP

<div>Expanding awareness</div> 	<p>A. Obtaining instruction in/ seeking to understand the process of care</p> <ul style="list-style-type: none"> • Following guidelines, protocols and policy documents <p>B. Focusing on relevant evidence</p> <ul style="list-style-type: none"> • Matching evidence to a very specific clinical context or specific patient • Using evidence to prompt additional, more detailed questions • Keeping up to date with the current evidence relevant to your job <p>C. Seeking evidence to integrate into existing knowledge and experience</p> <ul style="list-style-type: none"> • Contextualizing of evidence by judgement and knowledge / Allowing judgement and knowledge to evolve in light of awareness of evidence <p>D. Experiencing evidence as a concept</p> <ul style="list-style-type: none"> • Allowing a scientific basis for practice • Allowing an objective, evidentiary underpinning for practice <p>E. Experiencing evidence as a tool within policy</p> <ul style="list-style-type: none"> • Auditing practice • Developing of protocols and guidelines <p>F. Experiencing evidence as contributing to an practice ideal</p> <ul style="list-style-type: none"> • Allowing experience and evidence to create an integrated mutually informing basis for practice
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Awareness of Information Literacy in the context of EBP moves from a passive (within an understanding of the basis of accepted practice) to a more active use of information (in application to specific practice priorities). A still wider and deeper awareness of its complexities involves integration of evidence with experience; the nurse at this point is beginning to operate within a deeper understanding of effective EBP. Deeper awareness still, involves contexts which involve the finding and using of evidence in an increasingly conceptual and strategic way...until finally as a facet of a 'philosophical' or abstract idea of ideal practice.

Table 8.5.5. Theme of Expanding Awareness No.5.

Information Literacy experienced within application of
Skills and Processes of evidence and other information gathering

<div>Expanding Awareness</div> 	<ul style="list-style-type: none"> A. Having the basic background competencies <ul style="list-style-type: none"> • Negotiating the technology B. Achieving 'Knowledgeable' functionality <ul style="list-style-type: none"> • Knowing how to use a library/ Library resource website C. Achieving 'skilled' functionality <ul style="list-style-type: none"> • Practising time efficient information gathering • Structuring evidence searches effectively D. Operating coherently in processes of evidence and other information gathering <ul style="list-style-type: none"> • Finding all or sufficient evidence E. Operating purposefully in processes of evidence and other information gathering <ul style="list-style-type: none"> • Critiquing relevant evidence effectively • Gathering and applying key information within the ward environment • Gathering evidence effectively for a team, or group project: guideline development or policy change F. Operating 'organically' in processes of evidence and other information gathering <ul style="list-style-type: none"> • Having 'clarity of purpose and action' when gathering evidence
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Awareness of the potentialities of this aspect of Information Literacy expands from the ability to perform the basic relevant functions to an expanding sense of capability: feeling knowledgeable, then skilled; the latter seen to be the ability to put knowledge into effective practice.

The Information literate nurse then progresses to a sense of being able to 'operate': coherently – or 'competently' – skills able to be made use of in appropriate and significant contexts; then, with greater complexity of experience, with planned purpose. The widest level of awareness of the complexities of the experience of this aspect of Information Literacy is that in which information gathering operates in a way fully integrated into the nurse's professional life: instinctively, purposefully and successfully fulfilling it aims.

Table 8.5.6. Theme of Expanding Awareness No.6.

Information Literacy experienced in the context of an

Understanding and Knowledge of the principles and concepts behind evidence and other information gathering

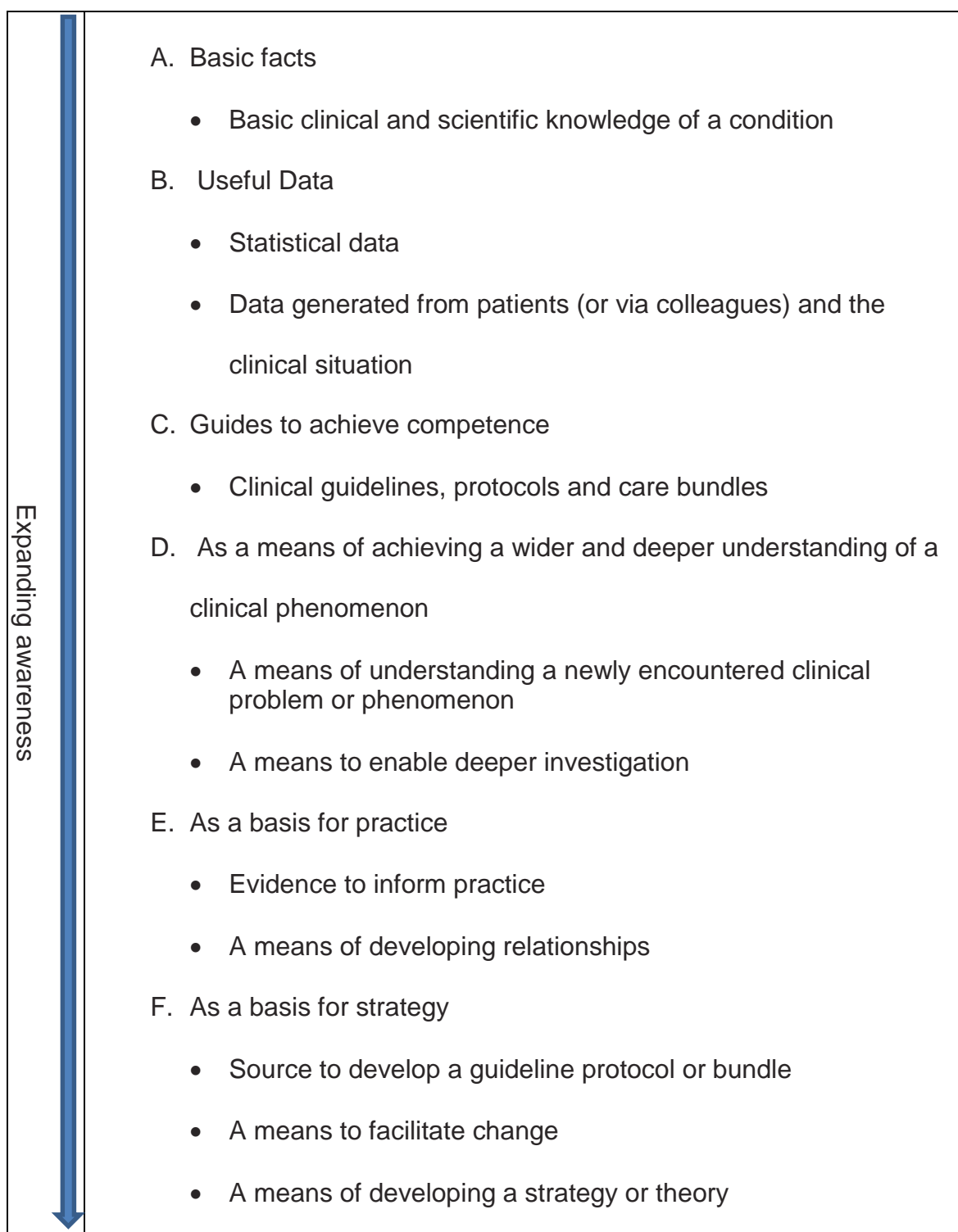
<div> <div>Expanding Awareness</div>  </div>	<ul style="list-style-type: none"> A. Having the background technical knowledge of information sources and types, needed to find and use evidence <ul style="list-style-type: none"> • Having knowledge of information types • Having knowledge of correct / credible sources/databases B. Being knowledgeable in medical information and research <ul style="list-style-type: none"> • Having an understanding of the complexities, meanings and structures of medical information and research evidence C. Being knowledgeable of functions within information gathering <ul style="list-style-type: none"> • Having knowledge of database/information source structure and functions D. Being knowledgeable of search syntax <ul style="list-style-type: none"> • Having knowledge of MeSH, subject headings, textwords and how they can be used E. Being knowledgeable of search strategy <ul style="list-style-type: none"> • Having knowledge of the structuring of searches F. Having a grasp of 'purpose' in Information gathering <ul style="list-style-type: none"> • Understanding how to respond to an information need
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In this Theme Information Literacy is experienced in the context of a knowledge of information sources and information gathering methods. Awareness of the potentialities of this aspect of Information Literacy moves from the categorical to the complexities of functionality; then to the higher level complexity of 'strategy' and finally to an 'organic' approach through an awareness of how to apply such knowledge and when.

Table 8.5.7. Theme of Expanding Awareness No.7.

Information Literacy experienced through

Applicable conceptions of information



This aspect of Information Literacy is a conceptual/abstract one within the broader phenomenon. It involves an ever greater awareness of the conceptual potentialities within the nature of Information. This expands from a reductive experience of information as basic 'facts' to the more complex concept of 'data'. With more complex experience, the awareness of the breadth and complexity of information's role increases: from a deeper understanding of a particular condition to conceptions in which it is at the very basis of practice. And finally reaching an awareness in which it informs strategic development. A move from data to Information to knowledge and then wisdom.

8.6. Categories of Description of the Experience of information Literacy in Nursing Practice

The next stage of the data analysis process (**Section 7.4.7**) involved the creation of Categories of Description.

As described above, a Category of Description ‘represents a qualitatively different way of experiencing a phenomenon.’ (Irvin 2005, p.102) and are generalised but representative conceptions, or experienced meanings, of Information Literacy.

As described in Section 7.4.7. each of the Categories of Description

- brings together experience of all aspects (Themes) of Information Literacy into a single description
- provides a description of experience at a particular level of awareness of the phenomenon’s potentialities in the development of complex knowledge and ‘wisdom’ (re: Section 1.1.).

6 Categories were developed. Each category has an internal structure of 7 Dimensions of Variation.

As implied above, one Dimension has been taken from each of the 7 Themes, and at the same level of awareness. This fulfils the requirement of logical consistency, as recommended by Åkerlind (Åkerlind 2005d).

For example, **Category A** takes its dimensions from the lowest level of awareness in each Theme (**Dimension A**), **Category B** from the next highest (**Dimension B**), and so on. Validity will be discussed in Section 8.8.

The Categories of Description are:

- A. The passive minimalist.
- B. The knowledgeable goal achiever
- C. The focussed, competent and evolving professional
- D. The confident and trusted promoter of justifiable change
- E. The Teacher and Promoter of an evidence-based culture
- F. The Leader, Philosopher and Strategist

Each Category has been **expressed in the form of a 'persona'**. This is not present in the literature, but was thought appropriate for a study analysing the experience of information literacy by professionals 'performing' a role.

Each persona implies the complexity of knowledge and wisdom required to function at that level of professional role. That is, the outcome of the complexity of experience of Information Literacy belonging to that Category of Description.

The categories are 'archetypes' and do not describe an actual nurse or nurses. In reality, individual nurses may be capable of acting and experiencing as described in one or more Categories at different times and under different contexts and conditions.

8.6.1. The Categories of Description and their Internal Structure

Below, each Category of Description is described and the internal structures given in detail. The 7 Dimensions of Variation are listed for each Category, identified under the two aspects, process and meaning, of experience of a phenomenon described in the Phenomenological literature (Cerbone 2006). Bruce (1998) refers to referential (meaning) and structural ('the way the conception is 'organised' to give rise to that meaning' (Bruce 1998, p.27)) aspects of a conception, or 'way of experiencing the world'.

The 'reality' of these two aspects became quite clear during the data analysis process. The Themes of Expanding Awareness could be labelled as either an awareness of process (or 'noetic' themes, which describe the 'activity across time' component of the experience of a Phenomenon) or an awareness of meaning (the noematic, or meaning component of the experience) (Cerbone 2006). Although some themes involved an expanding awareness of Information Literacy which involved moving from a noetic to a noematic awareness – that is from awareness of process to awareness of meaning.

Each Category's constituent Dimensions of Variation have been categorised at Noetic or Noematic resulting in an internal structure for the Category in which the two aspects of experience are identified and brought into conjunction.

Category A

'The passive minimalist.'

This category describes experiences of information literacy in which 'the facts' are obtained to deal with the immediate and simple issue or context. Passive information absorption occurs as frequently as information gathering; the latter may frequently be of the 'scavenging' type.

Internal Structure of Category A

Noetic

- Professional development involves seeking out knowledge of clinical contexts and conditions
- Development of relationships involves remaining a passive recipient of knowledge and information
- Fulfilling Information Literacy's role in helping the team practice with sufficient information to function
- Performing basic background competencies (e.g. in IT) in the Skills and Processes of evidence/ information gathering

Noematic:

- Understanding of EBP is limited to one of 'obtaining instruction' or seeking to understand the reasons for care
- Having the background knowledge of info. Sources and types needed to find and use evidence
- Having an understanding of information as basic facts

Category B

‘The knowledgeable goal achiever’

This category describes a way of experiencing information literacy in which the nurse is focused on specific goals. Information is sought out, identified and applied in the context of specific clinical requirements; this is done in conjunction with a developing background knowledge which allows the nurse to know how to address these aims. Skills and relationships are developed with such goals in mind.

Internal Structure of Category B

Noetic:

- Achieving ‘Knowledgeable’ functionality
- Interacting actively – a give and take of information interaction with patients and colleagues
- Helping the team practice with sufficient information to function
- Focusing on relevant evidence

Noematic:

- Being a knowledgeable nurse
- Being knowledgeable in the kinds of medical information and research
- Information understood as useful data

Category C

‘The focused, competent and evolving professional’

In this Category Information Literacy is experienced in processes of professional effectiveness and achieved functionality. This is governed by a widening awareness of the value of finding and applying evidence and the ability to do so in terms of what can be achieved in improved practice and patient outcome.

Internal Structure of Category C

Noetic:

- Using evidence as a tool for ‘improvement’
- Seeking out evidence to integrate into existing knowledge and experience
- ‘Skilled functionality’ in Information gathering processes
- Developing functional relationships

Noematic:

- Achieving professional competence
- Knowledge of functions within information gathering
- Information as guides to competence

Category D

The confident and trusted promoter of justifiable change

Information Literacy is experienced as one of the means and stimuli of an incipient tendency to think abstractly and strategically and as a leader: confident, trusted and with that increasing grasp of the parameters of practice which results in an understanding of the potential value of change and where and how it may usefully occur.

Internal Structure of Category D

Noetic:

- Developing strategies of justifiable change
- Operating coherently in processes of evidence and other information gathering

Noematic:

- Achieving professional confidence
- Developing the trust of patients, families and colleagues
- Experiencing evidence as a concept
- Being knowledgeable of search syntax
- Information experienced as a means of achieving a wider and deeper understanding of a clinical phenomenon

Category E

The Teacher and Promoter of an evidence-based culture

Information Literacy is experienced in contributions to the performance of roles in which a wider strategic focus is beginning to operate; evidence is skilfully obtained and applied towards the development of policy. A leading contribution is made to the development of an information rich culture, often in a teaching role, especially with junior staff.

Internal Structure of Category E

Noetic:

- Developing a teaching role within the team
- Experiencing evidence as a tool within policy
- Operating purposefully in evidence/ information gathering

Noematic:

- Achieving functional autonomy as a professional
- Developing an information rich culture to achieve 'Best Practice'
- Being knowledgeable of search strategy
- Information understood as a basis for practice

Category F

The Leader, Philosopher and Strategist

The most sophisticated level of experience of Information Literacy operates in the context of the nurse as leader, through its part in the promotion of the development of the ability to think strategically and philosophically. The ethics of obtaining or failing to obtain the evidence for best practice, the relationship of evidence to knowledge and experience and the strategic use of evidence and other information are amongst the challenging contexts in which Information Literacy is experienced in this category.

Internal Structure of Category F

Noetic:

- Developing a leadership role
- Operating 'organically' in information gathering

Noematic:

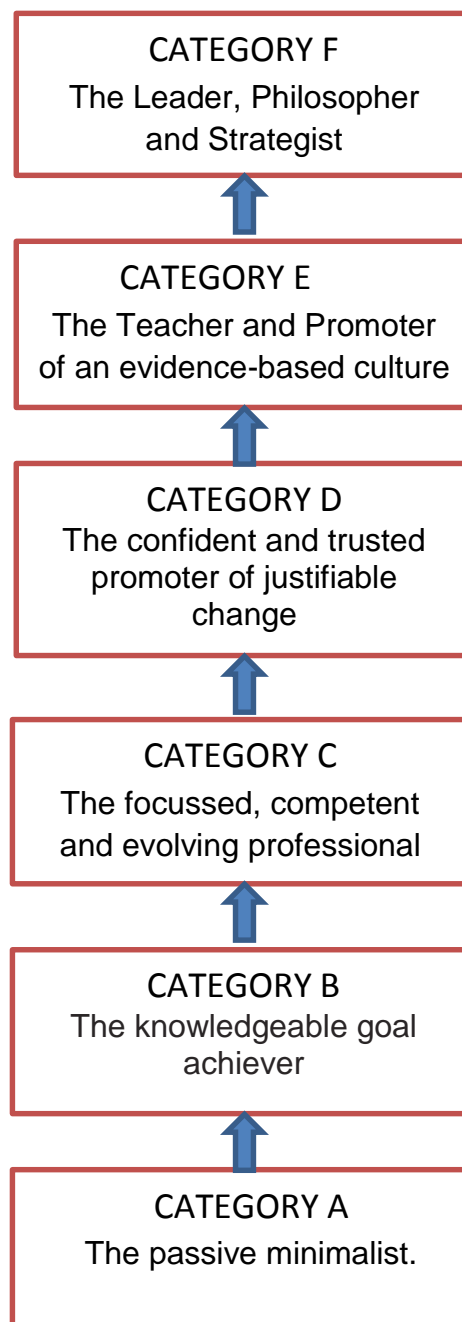
- Experiencing evidence as contributing to an practice ideal
- Having the ability to think strategically and philosophically
- Having a grasp of 'purpose' in information gathering
- Achieving best practice by developing an information-supported ethical focus to care
- Information seen as a basis for strategy

8.7. The Outcome Space

As described in **Section 7.4.8**. Marton and Booth's (1997) three criteria for judging the quality of a phenomenographic outcome space were adopted as a guide:

The Outcome space for this study is a hierarchical one in which one moves from Category A through to Category F in a logical sequence from least to most complex experience of Information Literacy. Each Category is distinctive stage in that 'sequence' and is a defined way of experiencing the phenomenon.

Figure 8.7. The Outcome Space



This is a picture of the whole experience of Information Literacy in the Nursing profession, in which the experience represented by the Categories of Description evolves from in the least to the greatest experience of the complexities or potentialities of the phenomenon (Åkerlind 2008).

8.8. Validity and Reliability of the Categories of Description and the Outcome Space

The validity of the Categories of Description and Outcome Space has two components: *Empirical* and *Logical* (Åkerlind 2005d)

8.8.1. Empirical Validity

The idea behind this form of validity check is to ask members of the studied group (not necessarily the sample) if the descriptions of experiences make sense in terms of what they know of the profession. Any experienced nurse could perform this role. Do the Dimensions of Variation, the Themes and Categories make sense in terms of what is known about nursing practice by those with experience and knowledge of it? That is, do they make sense to experienced and well-informed nurses?

Three individuals were approached to comment on the findings above:

Consultant A is a Sister in a Chest Allergy Clinic and was Participant 22 in the main study and Participant B in Stage 2.

I definitely agree [The findings] fit in with my experience of nursing. I have been very aware of my own development and reflecting back on my practice over the years I realise I have transitioned through some of these phases and can relate to this. I also am aware of other nurses under my management who are at various stages as you've described!

Consultant B is a senior Lecturer in Child Nursing at the University of West London with over 20 years on the nursing register. For her, the findings of Stage 1 reflected recognised aims of the nursing profession in the UK:

The findings reflect what the profession aims for nursing. The Code of Conduct (NMC) talks about acting in the best interests of our patients. The 6 C's, as identified by the Chief Nursing Officer, are also reflected in the findings - the need for nurses to provide care, compassion, competence, communicate, show courage and commitment.

Consultant C is a Senior Lecturer in Adult Nursing and Lead in Postgraduate courses. She also saw congruence with current aims of the Nursing profession and the language used to describe them.

This made interesting reading. [The Categories] sit well with nursing education and practice, and the taxonomy mirrors several used in Nursing (KSF framework, Leadership academy model, advance level nursing position statement, NMC competency frameworks) so I think this gives it more credibility.

8.8.2. Logical Validity

Logical validity is concerned with the ability of the structures created from the empirical evidence to yield acceptable meaning. Do the Themes of Expanding Awareness have a logical structure and validity – that is, does this grouping of Dimensions have an interpretable meaning? Does the arrangement of the Dimensions exhibit a traceable expansion in awareness of Information Literacy? Do the Categories of Description and the Outcome Space have a logically defensible structure and identity?

Categories of Description were developed logically, in that each Category was constructed from Dimensions of Variation at the same level of awareness (A, B, C, D, E or F) within each Theme (see Figure 7.4.).

Expanding Awareness ↓	Themes of Expanding Awareness							Categories of Description A B C D E F
	1	2	3	4	5	6	7	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	
	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	Dimension	

Figure 7.4. The relationship between Dimensions of Variation;

Themes of Expanding Awareness and Categories of Description

In addition, as described in Section 8.7. logical structure is a key aim of the method used to develop the Outcome Space; the final Outcome Space was the most logical relationship between the Categories.

8.8.3. The Findings of Stage 1 in the Context of Previous Research into Information Literacy Experience

Can the results above be compared to significant and representative phenomenographic studies into Information Literacy experience and so lend further validity to the study? A selection of studies, including the seminal work of Bruce (1997), is analysed below.

Bruce (1997)

As discussed above, Bruce's (1997) seminal research into Information Literacy experiences of Australian academics using Phenomenography-based methods found that Information Literacy can be experienced in seven ways, expressed as the following Categories of Description:

1. As a user of IT
2. As knowing what information sources to use
3. Knowing processes to search those sources
4. Information control: having information stored and easily to hand
5. Knowledge construction: building a personal knowledge base
6. Knowledge extension: combining knowledge and personal perspectives to create new insights
7. Wisdom: using information wisely for the benefit of others: exercising judgement, making decisions, doing research; placing the information in a wider context.

A comparison between these findings and those of the current study is set out below.

Category 1 As a user of IT

corresponds to sub-dimensions such as

- 44. Negotiating the technology
- 45. Knowing how to use a library/ Library resource website
- 56. Having knowledge of database/ information source structure and functions

And also to Theme 5 in a more general way: *Information Literacy experienced within application of Skills and Processes of evidence and other information gathering*. In which the technical aspects of on-line information gathering are negotiated successfully.

Category 2 *knowing what information sources to use*, corresponds well to Dimensions and Sub-Dimensions from Theme 6 such as:

- *Having the background technical knowledge of information sources and types, needed to find and use evidence*
- *Having knowledge of information types*
- *Having knowledge of correct / credible sources/databases*
- *Being knowledgeable in medical information and research*
- *Having an understanding of the complexities, meanings and structures of medical information and research evidence*

As well as aspects of Theme 7 *Information Literacy experienced through Applicable conceptions of information*

Category 3 *Knowing processes to search those sources* appears to be a composite of the aspects of Information Literacy experience described by

Theme.5. *Information Literacy experienced within application of Skills and Processes of evidence and other information gathering* but also to some extent Theme.6. *Information Literacy experienced in the context of an Understanding and Knowledge of the principles and concepts behind evidence and other information gathering*

Category 4. *Information control: having information stored and easily to hand* is less easy to map. However Themes 3 and 4 which concentrate on information acquired in order to inform practice, may be a (profession specific) form of this, especially those which imply a sufficiency of information being obtained for competence, and so correspond more to the accumulation of a 'critical mass' of information which is perhaps implied in Category 4. The Theme 3 dimensions: *Practising with sufficient background information*; and *Helping the team practice with sufficient information to function* for instance.

Category 5. *Knowledge construction: building a personal knowledge base* can also be mapped to Themes 3 and 4. In this study, 'building a personal knowledge base' expresses itself in a professional context, by means of Information Literacy's role in facilitating competence and excellence, for example in Theme 3 as expressed in the two 'lower' dimensions of variation, *Practising with sufficient background information* and *Helping the team practice with sufficient information to function*.

Category 6 *Knowledge extension: combining knowledge and personal perspectives to create new insights* reflects the dimensions which involve

acquiring evidence as a motor for change in practice e.g. *Using evidence as a tool for 'improvement'*; and *Developing strategies of justifiable change*. It also matches that Dimension which reflects contemporary understandings of EBP as a blending of research evidence and evidence from other sources *Seeking evidence to integrate into existing knowledge and experience*.

Category 7 *Wisdom: using information wisely for the benefit of others: exercising judgement, making decisions, doing research; placing the information in a wider context* corresponds to Dimensions of variation such as *Developing an information supported ethical focus to care; Developing a leadership role; Having the ability to think strategically and philosophically*. As has been noted, this Category corresponds well to the highest category in this study: Category F: *The Leader, Philosopher and Strategist* and to its constituent dimensions.

Andretta (2010)

Andretta used Phenomenography to look at how Information Literacy was experienced by post-graduate information management students. In Andretta's study the most complex experience, described in the 'Education' category, described the experience of students who were able to take on the role of an educator. This corresponds to many of the higher Dimensions of Variation e.g. *Functioning as a teacher for junior colleagues and other members of the team* and *Fulfilling a leadership role within the team* and of course to Categories E and F.

Toledano O'Farrill (2008)

Toledano O'Farrill's (2008) study focused on what he identified as failure of Information Literacy frameworks such as that of SCONUL to address the 'mutual' aspect of Information Literacy. This could be described as an exchange of knowledge and information between members of a team. In his investigation into nurses in a tele-health team, his main findings could be summarised in the form of an Outcome space: *Seven conceptions of effectiveness* containing the following Categories of Description:

- 'managing performance'
- 'support and effectiveness' -
- 'development of the knowledge and skills base'
- 'appropriate processes'
- 'appropriate decision making'
- 'appropriate communication'
- 'appropriate outcomes'.

In the current study, Theme of Expanding Awareness No.2: *Information Literacy experienced in development and maintenance of Relationships with patients, patients' families, colleagues and other professionals* had the following Dimensions, in order of expanding awareness.

- A. Interacting passively with others –others as a source of information
- B. Interacting actively – a give and take of information
- C. Developing functional relationships
- D. Developing the trust of patients, families and colleagues

E. Developing a teaching role

F. Developing a leadership role

These appear to confirm Toledano O'Farrill 's claim that Information Literacy has a 'social' aspect in which information is shared. 'Managing performance' maps closely to the dimensions which involve teaching and leadership.

'Appropriate communication' maps to the first three dimensions but also the fourth 'developing the trust of patients, families and colleagues' in a more 'complex' sense in that communication facilitates the development of trust; 'appropriate decision making' can also be mapped to 'Developing a leadership role'

Theme.3 can be mapped to several of Toledano O'Farrill's categories. Most obviously the Dimension: *Helping the team practice with sufficient information to function.*

In addition:

- *Practising with sufficient background information*
- *Helping the team practice with sufficient information to function*
- *Developing an information rich culture*

Can be mapped to Toledano O'Farrill's :

- development of the knowledge and skills base
- support and effectiveness

And

- *Attempting to improve individual outcomes*
- *Facilitating patient safety*

Can be mapped to:

- ‘appropriate outcomes’.

Altogether, there seems to be enough correspondence between the findings of the current study and earlier studies to give support to claims of validity to this study. This works both ways; the validity claims of those studies are in turn re-enforced.

8.8.4. Mapping against the SCONUL 7 Pillars and ACRL’s ‘Threshold Concepts’

Can the 7 Themes of Expanding Awareness be mapped against the SCONUL Seven Pillars of Information Literacy?

It would appear that Themes 1, 2, 3 and 4, the Themes which focus on an aspect of a Nurse’s role, relationships or practice, involve all 7 Pillars simultaneously. All functions described by the 7 Pillars could be said to be in play while performing the aspect of the nurse’s role that each relevant aspect of Information Literacy experienced in these 4 Themes describes.

Themes 5, 6 and 7 are more limited. Themes 5 and 6 can be mapped to *Identify*, *Scope*, *Plan* and *Gather* as ‘information gathering’ Themes. Theme 7 can be mapped to *Identify* a need, establishing the *Scope* of the search and the processes which *Evaluate*, *Manage* and *Present* the information found. These are activities in which concepts of Information are required in order to be performed meaningfully.

Meyer and Land's (2003) 'Threshold concepts' have been introduced to a wider audience through the new ACRL Information Literacy definition (ACRL 2015)

'...can be considered akin to a portal, opening up a new and previously inaccessible way of thinking about something. It represents a transformed way of understanding ... without which the learner cannot progress'

(Mayer and Land 2003, p.1)

Threshold concepts could be found in any of the contexts described by Themes 1,2, 3 and 4. In the aspects of a nurse's experience of Information Literacy described in these Themes, transformational experiences through Information Literacy are possible in several professional contexts. For example, Theme 2 employs in its more complex dimensions the concept of the 'Patient Advocate'. A concept which once grasped could be said to be transformational (Hoffman 2013).

8.8.5. Reliability

Reliability of the Dimensions and the Themes and Categories created from them could be confirmed, it can be hypothesised, by a second interview with the participants. Do the same Dimensions appear in the second interview transcript for each participant as in the first? If Dimensions have been added can the change be accounted for? If so then reliability is confirmed.

In Stage 2 of the study, a second interview is undertaken for 7 of the Stage 1 group. Findings from Stage 2, which are presented in Chapter 11, indicate a significant level of reliability can be claimed in this way.

8.9. Summary

The results described above attempt to give an overall picture of how Information Literacy is experienced by Nurses. A sample of 41 nurses, covering a broad range of relevant variables and having achieved data saturation, produced 6 Categories of Description representing ways of experiencing Information Literacy. Each Category had a structure consisting of 42 generalised (70 contextual) Dimensions of variation in 7 Themes or contexts in which Information Literacy is experienced. Logical and empirical validity were addressed.

Chapter 9 will describe how these findings can be used to form an evidence-based Information Literacy educational intervention for nurses.

Chapter 9

Towards an Evidence-Based Information Literacy Educational Intervention for Nurses

9.1. Introduction

The Third Aim of the study was:

To use the parameters of Information Literacy in Nursing to develop an outline of the structure and content of an evidence-based Information Literacy educational intervention for nurses

As we have seen, the origin of the study lay in an awareness of a lack of understanding of how Information Literacy was experienced by Nurses, and corresponding lack of evidence on which to base Information Literacy education. Could the experience of Information Literacy in Nursing as a profession be investigated, described, and then used to develop an evidence-based intervention?

Finding the 70 sub-Dimensions of Variation in Awareness, the 7 Themes in which Information Literacy operates in Nursing and the 6 Categories of Description which describe, in varying contexts and different levels of complexity, the ways in which Information Literacy is experienced, was the first stage in developing an evidence-based module (Åkerlind 2008). This gave a framework of educational 'goals' to be achieved by the student. Goals expressed in terms of the professionally relevant knowledge and wisdom that nurses create through Information Literacy, linked to the

contexts and processes involved in doing so, around which development of their Information Literacy experience could be focused.

However there remained the question of how to progress from possession of these basic elements to a framework of an educational intervention. How could the Sub-Dimensions, Themes and Categories be developed into an *outline of the structure and content of an evidence-based Information Literacy educational intervention for nurses*? Variation theory, an educational theory derived from previous phenomenographic research, was applied to that end.

9.2. Applying Variation Theory

There are a number of theories of how learning occurs. The research of Marton and colleagues, conducted using phenomenographic methods, lead them to the conclusion that '*Learning is learning to experience*' (Marton and Booth 1997, p.210); learning to experience something in a certain way for the first time. Expressed in ways used in earlier chapters, it is to learn to experience a concept in new ways so that it takes on additional meanings (Marton and Booth 1997). In other words, one's conceptions of it change. Bruce applied this approach to Information Literacy:

'Learning is about changes in conception – teachers need to assist students in developing new and more complex ways of experiencing information literacy'. (Bruce 2006, p.6)

Åkerlind (2008) describes two stages in the effective use of Phenomenography to inform the design and content of educational interventions:

1. *The phenomenographic investigation into the complete picture of the variation of the experiences of a concept.*
2. *The application of 'variation theory' to a teaching and learning programme to maximise students' opportunities for discerning the full range of key features of the concept in the previous investigation* (Åkerlind 2008, p.638)

It may be the case that the reason Variation Theory has not been more widely adopted is that it requires a phenomenographic study of the relevant population. There are perhaps insufficient of these.

The Variation theory of learning, which developed from phenomenographic research, proposes that learning occurs when variations in ways of experiencing a concept are perceived (Marton & Booth 1997; Bruce et al 2006; Runesson 2006; Marton & Pong 2013).

Aspects of the Phenomenon Open to Variation – The Themes of Expanding Awareness

As we have seen, phenomenographic research concentrates on the variations in the experience of a phenomenon. What accounts for the variations in experience? Variation theory suggests that this is due to different aspects of the phenomenon being discerned in different ways by different individuals (Marton and Booth 1997; Åkerlind 2008). If a phenomenon has an aspect of itself open to variation in perception, then this aspect is a source of 'dimensions of variation' of perception of that aspect (Marton and Booth 1997; Åkerlind 2008; Runesson 2006). The aspects of the phenomenon of information Literacy in this study open to variation in perception can be identified as the 7 Themes of Expanding Awareness. Each with their Dimensions of Variation corresponding to the variations in the '*increasing breadth of awareness*' (Åkerlind 2008, p.636) or complexity of the discernment of that aspect of Information Literacy. Categories of Description, therefore, '*reflect the difference in structure and organization of awareness*' (Runesson 2006, p.406) and are '*a way of experiencing which is a complex of simultaneously discerned dimensions of variation present to awareness*' (Runesson 2006, p.406).

More Than One Aspect Must be Varied for Learning to Occur

For Runesson, summarising the work of Marton and Booth and others, grasping a concept requires that '*certain aspects* [of the concept] *must be discerned at the same time*' (Runesson 2006, p.401); variation must therefore have more than one source - in terms of the current study, within more than one Theme of Expanding Awareness. By varying the way a concept is brought to a student's experience, through the range of relationships between the Dimensions of different Themes brought into conjunction, the student comes to appreciate new facets of the concept and therefore potential ways of 'fitting it in' to their experiences in the future. For example Theme 2: *Relationships with patients, patients' families, colleagues and other professionals* if brought together with Theme 5: *Skills and Processes of evidence and other information gathering*. Students could be led to see the many different ways in which having good information gathering skills could provide the quality information which supports and develops relationships: supporting patients to make good choices or colleagues to improve their roles within the team. Variation theory posits that it is by varying critical aspects of the phenomenon, the critical aspects being those which are variable, and allowing the phenomenon to be experienced in differing combinations of the varying aspects, a deeper and more complex grasp of the phenomenon occurs (Marton and Booth 1997).

Variation may even usefully involve absence (Runesson 2006). What happens if information Literacy is absent from a nurse's experience in certain contexts, what would be the consequences for patients? This is a scenario which has proven stimulating for students of the SEARCH for Health module (Unit 1) and was a theme underlying part of the Stage 1 interview protocol.

The Necessity of Background Invariance

Should all of the Themes be simultaneous sources of variation? For Runesson there is '*the importance of creating a pattern of variation and invariance in relation to the critical aspects* [those open to variation].' (Runesson 2006, p.408). Only through a background of 'invariance' can the variations and the relationship between them be brought into focus for the learner. For Åkerlind, the educational intervention should draw '*attention to different aspects of the phenomenon by varying aspects whilst keeping others invariant.*' (Åkerlind 2008, p.637). Only some Themes should be varied together in any one educational activity; others remain unvaried.

Conceptual Expansion

Åkerlind (2008) identifies the educational approach of phenomenographic variation theory to be 'conceptual expansion' rather than the conceptual replacement approach of some other theories. Less sophisticated experiences of a phenomenon are not regarded as defective but merely incomplete, lacking aspects of the phenomenon '*that are focal in more sophisticated conceptions*' (Åkerlind 2008, p.637). And therefore there is no rejection of ways of experiencing a phenomenon but an expansion of them to include those focal to the more sophisticated experiences. In terms of the current study, the ability to experience Information Literacy as described in Categories E and F would be built up without attempting to destroy the ability to experience as in Category A. As is clear from the data, there are circumstances in which Category A, the lowest in terms of complexity of experience, will be 'appropriate' to the nurse's needs and role in a particular instance.

9.3. Structure, Content and Method

Variation Theory, therefore, is the basis for the educational approach of our module. Themes of Expanding Awareness are paired so that variation in each Theme is experienced in the context of variation in its partner while the remaining Themes remain unvaried.

A Role for the SCONUL 7 Pillars?

Some may assume that the Seven Pillars of Information Literacy should still have a role in the module. (*Identify* an information need, map out the *Scope* of the search required, *Plan* the information search, *Gather* the information, *Evaluate* the information, *Manage* it efficiently and ethically, *Present* it in its new context (SCONUL 2011)). However it must be asserted that the skills and knowledge associated with the seven pillars (and the RCN (2011) framework of competency closely based on it) have been given a context and focus meaningful to nursing experience in the findings of the study. They are contextualised in the 7 Themes - The first four Pillars in Themes 5, 6 and 7, and the remaining pillars in the first 4 Themes, and so, it is suggested, do not need to be referred to explicitly. The main purpose of the study was to develop parameters of Information Literacy based on the actual lived experience of nurses – a framework therefore more relevant for educational purposes than any without that basis.

Structure and Variation

As we have seen, the 7 Themes of Expanding Awareness, are the 'aspects of the phenomenon open to variation' (Åkerlind 2008; Runesson 2006). The

Themes therefore give the context for educational activities. The purpose of which is to develop the experience of Information Literacy exhibited in the context of that Theme, through the simplest to the most complex Dimension of Variation and, therefore, Category of Description.

We have also seen that Variation Theory implies that this is to be achieved through the recognition of '*the importance of creating a pattern of variation and invariance in relation to the critical aspects* [of those open to variation].' (Runesson 2006, p.408). And that it is critical that variation is applied against a 'background' of invariance. Experiencing variation in the critical aspects of the phenomenon is achieved by '*drawing attention to different aspects of the phenomenon by varying aspects whilst keeping others invariant.*' (Åkerlind 2008, p.637). Therefore study materials in our prospective Information Literacy module for nurses should be based on introducing varying dimensions of each Theme, though only some Themes should be varied for each activity; in other activities these Themes will remain unvaried while other Themes are varied.

For example, again using the example mentioned above, activities which concentrate on varying Theme 2: *Relationships with patients, patients' families, colleagues and other professionals* and Theme 5: *Skills and Processes of evidence and other information gathering* together, while not varying other Themes. Such activities would focus on in general terms: *What does it mean to relationships with other professionals and with patients and family to be able to employ a range of techniques to identify and locate information for them and to share with them in differing contexts? What does Information Literacy mean within these parameters?* This might involve scenario work in which colleagues or patients are described in terms of their

background and knowledge need. The students is required to search for relevant information and reflect on the consequences for that person of the nurse providing or not providing relevant information, and for the student's relationship with them. Scenarios will vary in terms of the complexity of information and its potential significance to the patient. New Information Literacy experiences could involve both simple and complex relationships and information processes involving Dimensions from levels A through to F.

4 Stages of Variation

Marton and Tsui (2004) describe a way of making sure variation is meaningful and thorough. They recommend the following 4 stages are followed in the development of a complete programme.

Contrast: The choice of contrast is regarded as vital. The choice of Themes to form a pairing must be meaningful, and the Dimensions of Variation from the two Themes must be brought together in such a way to allow the full significance of variation within these Themes to be clear. For example, varying Themes 3 and 4 together will show that the varying complexities of Information Literacy experience in the context of EBP and in the development of Best Practice have a very significant effect on each other. This might be done by getting students to see how the accumulation of a more complex evidence-based knowledge contributes to, and is necessary for, achievement of such complex goals as 'Patient Safety'. Similarly Theme 3 could be varied with 5 and 6 to vividly show the contrasting effect of the varying complexity of experience of the skills and knowledge underlying effective information gathering, on the ability of Information Literacy to initiate the knowledge and wisdom needed to achieve such complex goals.

Generalisation: All Themes must be involved at some stage, and in contrast with more than one of the others if possible. There should be sufficient range of contrasts to give a complete 'picture' of the phenomenon being studied. This helps the student recognise and contextualize their own limited experiences and (hopefully) promotes learning. As well as a full use of the Themes, the variation in each Theme must be completely demonstrated. For instance, by allowing a nurse to be made aware of all of the potential value to patients, to her team and to her own professional expertise and standing, of the adoption of more (and in some cases less) sophisticated aspects of Information Literacy experience, considerable motivation to develop that experience may be created. For example, by showing that experience of Information Literacy in Theme 3 doesn't need to be limited to finding basic information on the patient but can contribute, that the nurse herself can contribute, to developing truly compassionate care.

Separation: This refers to the necessity of varying only some of the critical aspects of the phenomenon discussed above. This allows the features of the phenomenon to be distinguished clearly by the student. In our examples above and below only 2 or at most three Themes are varied together.

Fusion: Requires variation of aspects of the phenomenon to occur simultaneously to allow the relationship of the aspects to be made clear and therefore the whole structure of the phenomenon. Themes must be varied in pairs or threes, not individually.

The use of contrast and generalisation combined with separation and fusion should provide sufficient comprehensiveness, focus and differentiation to

produce learning experiences for nursing students which are likely to be effective (Åkerlind 2008).

The Proposed Module: Themes to be Grouped for Variation

Themes grouped for variation in order to generate learning activities for the proposed module are as follows:

- Theme 2: *Relationships with patients, patients' families, colleagues and other professionals* and Theme 5: *Skills and Processes of evidence and other information gathering*. (As described above).
- Theme 3: *Helping to achieve 'Best Practice'* and Theme 4: *Understandings and Experiences of EBP*.

As briefly described above, this variation grouping investigates the application of evidence by the nurse to her attempts to achieve the best practice possible. The latter can become more ambitious as the grasp of the role of evidence is expanded.

- Theme 3 *Helping to achieve 'Best Practice'* with Themes 5 *Skills and Processes of evidence and other information gathering* and Theme 6: *Understanding and Knowledge of the principles and concepts behind evidence and other information gathering*. As described above.
- Theme 4: *Understandings and Experiences of EBP*, Theme 6: *Understanding and Knowledge of the principles and concepts behind evidence and other information gathering* and Theme 7: *Information Literacy experienced through Applicable conceptions of information*

This variation grouping would thoroughly examine the understanding and meaning of Information and Information gathering in each function of EBP. A specific example might bring *auditing* and *knowledge of search strategy* and *information as a source of deeper investigation* into conjunction. What does Information Literacy mean when considered in terms of its role in audit; the varying conceptions of information used in Auditing; and the principles and concepts behind locating the information types that make auditing possible?

- Theme 1: *Professional Self-development* and Theme 3: *Helping to achieve 'Best Practice'*

This variation grouping examines the personal (ethical?) responsibility of the nurse in various professional roles to strive for Best Practice and how Information Literacy links and forms the fabric of increasingly complex and valued professional roles and Best Practice outcomes.

- Theme 1: *Professional Self-development* ; Theme 2: *Relationships with patients, patients' families, colleagues and other professionals* and Theme 7: *Information Literacy experienced through Applicable conceptions of information*

This group concentrates on the intimate relationship between professional role and relationships with others, in the context of how the information used and exchanged in that relationship is conceptualised. For example, information conceptualised as 'A means of understanding a newly encountered clinical problem or phenomenon', for a nurse 'Becoming able to function non-dependently within the team' while 'Functioning as part of the multi-disciplinary team'.

Thus Themes are meaningfully and tellingly varied (Contrast); all the 7 Themes are introduced at least twice (Generalisation) in pairs or threes (Fusion) while invariance in some themes is maintained within individual activities (Separation).

A Complete Range of Sophistication of Experience

However, *Generalization* has a depth and well as a breath dimension. It requires that learning materials should focus on experiences which cover the complete range of complexity within each Theme.

For Bruce (2006), Åkerlind (2008) and others, the ambition of an educational intervention should be to develop in the student the capacity for all of the differing variations of sophistication of experience described by the Categories of Description, not just the most sophisticated. Students should be educated into the complete range of simpler experiences even if they are already experiencing Information Literacy with a high level of sophistication. The value of doing so is confirmed by the Stage 1 findings in which all Categories of Description and their constituent Dimensions of Variation seem to have value and purpose when functioning in their particular contexts of Nursing practice.

Although not always clearly present in the brief descriptions of learning contexts above, this principle would be adopted in the detailed planning of learning materials in a piloted module.

9.4. Summary

Application of Variation Theory to the findings obtained from Stage 1 of the study has allowed an 'evidence-based' Information Literacy module to be sketched out. A range of contexts have been described for educational interventions, interventions which now require developing further into concrete activities which can be piloted and tested.

The proposed educational intervention sketched out above is based on how nurses appear to experience Information Literacy in practice, and so has some claim to likely effectiveness. But how can such this intervention and future similar interventions be shown to be successful? How can they be edited successfully if shown to be ineffective? Stage 2 of the study, described in the following chapters, in addressing Aim 4, attempts to answer these questions.

**PART 3: STAGE 2 OF THE STUDY: ANALYSING THE DEVELOPMENT
OF INFORMATION LITERACY**

Chapter 10

Measuring the Effect of an Information Literacy Module

10.1. Introduction: The Purpose of this Part of the Study

This chapter introduces Stage 2 of the study which addresses **Aim 4**

To analyse the information literacy development process in nurses with a view to practical application and improvement of outcomes.

As we have seen, Stage 1 produced a description of the parameters of the experience of Information Literacy by nurses. Chapter 9 sketched out the structure and content for a evidence-based Information Literacy module in Nursing based on these parameters.

This second stage attempted to build on the Stage 1 findings. Could an Information Literacy module not only be based on research evidence but could research evidence be used to prove its value and improve its effectiveness?

- Can expansion in an individual's Information Literacy experiences as a result of an educational intervention be mapped, in terms of their range and complexity?
- Can the value of an Information Literacy education intervention be audited, in terms of its ability to expand the range and complexity of experiences?

These questions were addressed by examining the changes in the experience of Information Literacy of 7 of the participants from Stage 1, after

undertaking the University of West London's existing Nursing Information Literacy module 'SEARCH for Health', by re-interviewing them and analysing and comparing the transcripts using the same phenomenographic analysis techniques.

This Chapter sets out the methods used in Stage 2. as briefly described in Section 5.3. The justification of the validity and value of the methods used in this part of the study were set out in Section 5.3.1.

10.2. Methods

Some of the participants from Stage 1 were approached at the time of initial interview to take part in this supplementary stage. Participants were approached via e-mail circulars or through the University VLE. Some participants were approached before their first interview and the complete 'programme' of two interviews either side of the Information Literacy course was described, others were approached a short time after the first interview with the additional offer.

Participants were offered a cash incentive of £30. The potential professional value of the development in their Information Literacy was described in detail as an additional incentive.

7 volunteers came forward. 3 of the original 7 dropped out before completion due to personal and professional time commitments and 3 further recruits had to be obtained. Sampling criteria are discussed below.

The Stage 2 Methodic Plan can be summarised as follows:

Step 1. Participants were interviewed as part of Stage 1.

Step 2. After the Stage 1 interview the Stage 2 Participants were enrolled in the SEARCH module

Step 3. Participants then completed the SEARCH module.

To avoid unnecessary risk of participants pulling out, they were not given a time limit to complete the module as they were studying part-time and in very demanding jobs. The module is taught entirely on-line and students were

able to progress with it when they had time, but were periodically encouraged by the tutor to keep going. No doubt the learning process could have been improved for some participants if the module had been taught face to face. This was not a practical possibility. However in each case a change in experience was detected and could be interpreted, suggesting that engagement with the learning material occurred.

The module tutor (the researcher) was on hand to answer questions by e-mail or telephone. Students also completed short formative exercises at key points in the module and the tutor also responded to these (example Appendix 8).

Step 4. After completing the module, and after a period of time of at least 1 month had elapsed the participants were re-interviewed. It was clear that they were more likely to leave their jobs and so potentially be lost if the time period was longer than this. The purpose of Stage 2 was to test the method.

As long as some change in experience was detectable and could be interpreted then the second stage would be regarded as a success.

Participants were interviewed again using a *slightly modified* interview protocol. The modification was to prevent stock answers due to repetition, and to maintain a 'natural' interaction between the interviewer and participant in which it was not artificially ignored that this was a second interview. The elapsed time between the module and the interview was to allow educational experiences to become part of the development of new experiences of Information Literacy.

As described in Chapter 6, the basic structure for the protocol followed Åkerlind (2005c, p.106). The modified protocol consisting of the following:

Contextual questions which set the scene and encourage the participant to reflect on their experience of the phenomenon.

- You finished the SEARCH module while ago...I hope you found it useful?
- What parts did you find the most useful?
- What parts were the least useful?
- Did it affect your thinking on EBP? How would you summarize what you feel about it at the moment?

Primary questions:

a) Open questions

- Do you think you've become better at finding and using information? If so why / if not, why not?
- Do you think it has affected the way you think about finding and using research evidence?
- What are the ways that research evidence can help improve practice?
- What is your picture of a nurse who uses information effectively?
- What kinds of Information Skills and knowledge are necessary for EBP?
- In what ways do you think having poor information skills and research awareness have a negative effect on a nurse's practice?

b) concrete examples

- Do you have any recent examples of when you've used evidence-based information in practice – and why?
- Examples 1 2 3 etc
- How has EBP affected nurse relationships with other professions; with patients and family members?

- Can you give other examples of new ways you or your team have used research evidence to inform nursing practice or you think may use it in the future?

Unstructured follow-up questions check on the significance and meanings of earlier statements and encourage further elaboration.

Step 5. Data Analysis.

As will be recalled from Stage 1 (Chapter 8), after development of the sub-dimensions of variation, the transcripts were re-analysed to determine which of the 70 sub-dimensions were actually traceable in each one. Hence each Stage 1 transcript now had a list of sub-Dimensions of Variation which had been traced in it by careful re-analysis. These are set out in Table 8.3.

Similarly, after the second interview, the second transcript was analysed to determine which of the 70 sub-Dimensions of Variation could be detected. Both transcripts were now compared. Which new Dimensions are traceable in the transcript of the second interview? How many of the Dimensions are new for the participants? Which Themes of Expanding Awareness and Categories of Description have been developed and to what extent?

The answers to these questions were used to draw detailed conclusions on the educational effect of the module on each participant. This in turn allowed analysis of the effectiveness of the module itself to be undertaken. And finally the corresponding overall value and significance of the method, and tools derived from the method, in the development and analysis of Information Literacy could be described and assessed (Chapters 12 and 13).

10.3. Participants

The final membership of the Stage 2 group was determined by practical considerations. Large numbers would have been difficult to obtain in a reasonable time frame and would have been difficult to manage. The commitment involved in completing the module and then being re-interviewed was a considerable one.

However, a sufficient number would be necessary to observe a significant range of changes in experience sufficiently clearly, both in terms of scale and complexity.

Sampling

As described above, the sample was developed by asking for volunteers from the Stage 1 cohort. Further participants were advertised for until the final group was small enough to be manageable but contained a wide enough variation in the criteria listed in Chapter 6 (Age; Professional Experience; Nursing role and specialism; Seniority; Location; EBP education or other recent educational experiences) for both large and more subtle changes in Information Literacy experience to be observed and so incorporated into a sufficiently complex analysis.

Although the sample was by definition self-selecting, the purpose of Stage 2 was not to draw conclusions from a 'representative' sample but to accumulate sufficient data to allow the validity of the method proposed to satisfy Aim 4 to be assessed.

A brief description of the seven participants:

Participant A – (Participant 21 from Stage 1)

An African nurse reporting little or no Information Skills or knowledge of EBP before coming to the UK a year ago.

Interview 1 took place on: 22.10.12

Interview 2: 27.6.13

Participant B - Participant 22)

A highly experienced ward sister reporting good Information Skills if narrowly focused with excellent understanding and practical experience of EBP.

Interview 1: 24.10.12

Interview 2: 5.7.13

Participant C - (Participant 23)

A highly experienced nurse with good understanding of EBP but reporting limited Information skills

Interview 1: 29.10.12

Interview 2: 29.5.13

Participant D - (Participant 24)

A highly experienced ward sister reporting very poor information skills and a strong desire to improve these.

Interview 1: 29.10.12

Interview 2: 30.5.13

Participant E - (Participant 41)

A senior lecturer and clinical skills facilitator in Nursing at UWL. She had approached me to undertake the module as an agreed 'Professional development' activity suggested by her line manager.

Interview 1: 13.5.13

Interview 2: 23.10.13

Participant F - (Participant 15)

Staff Nurse in a Neonatal Clinic with one year's experience since registration. The Interview took place in the Trust library.

Interview 1: 7.8.12

Interview 2: 6.1.14

Participant G - (Participant 19)

A community Chlamydia screening co-ordinator and sexual health nurse with wide experience of providing services to young people.

Interview 1: 28.9.12

Interview 2: 14.1.14

10.4. The 'SEARCH for Health' module

The Information Literacy module developed by the current author before this research study had begun and employed within the BSc Nursing curriculum in the University of West London since 2011 is entitled 'SEARCH for Health'.

The rationale for the SEARCH for Health module was derived from the evidence-based nature of current practice in Nursing and other health professions. Nursing students require a comprehensive and thorough grounding in information literacy in order to complete their studies successfully and perform effectively as health professionals, and that this justified a distinct module on Information Literacy. A paper setting out the case for the module was submitted to the curriculum development group of the College of Nursing, Midwifery and Healthcare which had been given the job of formulating the structure of the new BSc Nursing course to be validated in 2011. Despite some resistance from some quarters, support from the individual responsible for the development EBP strand in the curriculum meant the module was adopted.

The module learning material covers:

- The reasons why EBP requires Information Literacy;
- the principal types of health information sources, including types of research and sources of 'raw' and mediated research evidence;
- how to identify appropriate information effectively and locate the original documents;
- how to appraise and modify information searching activities and appraise research papers;
- how to use an appropriate referencing system and referencing software.

The module consists of 6 Units to be studied in sequence and is entirely taught on-line (see Appendices 4 and 5 for more detail).

Unit 1 discusses the reasons why relevant and accurate information is needed in the health professions and introduces the important concept of EBP and the role of appropriate information sources within it. There is also analysis of the limitations of some of the commonly used means of finding information.

Unit 2 gives an overview of the many different kinds of information types and their potential value, significance and applicability. Different types of research study and research based information source are described together with their applicability and value.

Unit 3 discusses the concepts behind searching for research papers and allows students to see them put into practice through on-line demonstrations of key databases: CINAHL and Medline. Accessing and searching other databases and websites such as Cochrane Database of Systematic Reviews and the NICE Evidence Search is also covered. The use of a Library catalogue to search for a range of material on a specific topic is discussed.

Unit 4 discusses the locations, both physical and on-line, through which items identified through search activities such as those covered in Unit 3, can be accessed.

Unit 5 introduces ways to appraise search results for appropriateness and quality. The unit goes on to identify reasons why searching may go wrong and discusses ways of getting back on the right track.

Unit 6 discusses the proper methods of identifying and listing information sources, including an overview and demonstration of the

Harvard referencing system and the use of the referencing software package, Refworks. Additional detail is given in Appendix 7.

Background: What Students Think of SEARCH

While students reported in their module feedback forms that they appreciated the module, they also struggled to see its significance beyond the academic. At this stage in their training (Semester 1 of Year 1) they had little experience of practice and were just beginning to be instructed in the principles of EBP. It was not to be expected that the module's full significance was clear at this stage.

1 year after taking the module the September 2011 intake were contacted again and asked the following questions:

1. Did /do you find what you've learnt useful in your studies.
2. Do you find what you've learnt helps/helped you to understand 'EBP'
3. Have you been able to contribute information/research to discussions on the ward when you've been on placement?
4. Do you wish that some things had been included in the module?
5. Were some things in the module that you've never needed?
6. What has turned out to be the most valuable thing in the module?

15 questionnaires were returned with Question 1 getting an overwhelmingly positive result; however only some students replied to 2 and 3, although all of those were positive. It may be that even after a year, only some students, perhaps in the more open cultures described in Section 8.2, are able to match Information Literacy clearly in their own mind with EBP.

10.5. Additional Potential Limitations on Validity in Stage 2

Further potential limits on the Validity of Stage 2 data could be established:

- In the Interviews – there is possibility of unconscious directing of the participant by the interviewer to concentrate on new areas of experience
- In the Interviews – there is a likelihood that participants, aware of the previous interview and the purpose of stage 2, will modify their responses accordingly to try to show that they now have ‘improved’ Information Literacy.
- Data Analysis – similarly there might be a possible unconscious seeking, in the data analysis process, after new Dimensions of variation in the 2nd transcripts and so create a potential distortion in the process and so invalidate the findings. The researcher may unconsciously wish to magnify any meaningful, measureable change to validate the method.

The first and third of these potential threats were kept in mind and consciously counteracted where possible. The necessity as described in Chapter 3 for the interviewer not to lead the participant is a key requirement in successful phenomenographic interviewing. The data analysis process must involve enough ‘iterative’ analysis, to prevent, or make clear and so counteract, false emphases.

The second threat was ameliorated by the significant time period between the two interviews. Participants usually appeared not to remember clearly what they had said in the first interview.

The next chapter examines the data obtained from the methods described above for each of the 7 Participants, identified by letters A to G (section 10.2).

Chapter 11

Data from Stage 2

11.1 Introduction

This chapter sets out data from Stage 2 of the study.

This is set out for each of the 7 participants under the following two headings:

- Sub-Dimensions of variation identified in the interview transcript from Stage 1 (Interview 1)
- Sub-Dimensions identified in the transcript of the second interview conducted after the participant had undertaken the SEARCH Information Literacy module (Interview 2).

Each participant is identified in this chapter by a letter from A to G allocated in Chapter 10, where in each case the corresponding Stage 1 identification number was also given.

Other relevant information to this Chapter is given in Chapter 8. The identifying numbers of the sub-Dimensions of Variation are as given in Section 8.3. Each sub-dimension is set out in Section 8.5 under the named Theme of Expanding Awareness in which it functions and identified here by its number.

11.2. Participant A

11.2.1. Interview 1

The following sub-dimensions of variation could be determined in the first Interview.

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
2	-	22, 24, 32	37, 41	48, 49	54, 57	66, 69

11.2.2. Interview 2

The following sub-dimensions of variation could be determined in the second interview

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
2, 3, 5, 7	12, 17	20, 21, 22 23, 24, 25 27, 32, 33	37, 40	47, 49	54, 56, 57 58	63, 66, 69

11.3. Participant B

11.3.1. Interview 1

The following sub-dimensions of variation could be determined in the first interview.

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
5	11, 12, 13 16, 17	20, 24, 32	42	46, 51	55	63, 67

11.3.2. Interview 2

The following sub-dimensions of variation could be determined in the second interview.

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
1, 3, 5	11, 12, 13 16, 18	23, 24, 27 28, 32	35, 37, 38 42	46, 47, 51	53, 54, 56 57, 58, 59	60, 63, 64 66, 67, 69

11.4. Participant C

11.4.1. Interview 1

The following sub-dimensions of variation could be determined in the first interview.

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
1, 2, 5	12, 13, 14, 15, 17	19, 24, 25, 32	-	46, 48	53, 54	60

11.4.2. Interview 2

The following sub-dimensions of variation could be determined in the second interview.

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
1, 2, 4, 5, 7	11, 13, 15, 16, 17	19, 21, 23, 24, 25, 27, 29, 31, 32, 33	35, 37, 38, 40, 41, 43	44, 46, 47, 48, 49, 51, 52	53, 54, 57, 58, 59	60, 65, 66, 67

11.5. Participant D.

11.5.1. Interview 1

The following sub-dimensions of variation could be determined in the first interview.

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
2, 4	10, 11	24, 25	35	44, 46, 47	57	66

11.5.2. Interview 2

The following sub-dimensions of variation could be determined in the second interview

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
1, 2, 3, 4, 5	10, 11, 12 13, 17	20, 21, 23 24, 25, 30	37, 40	44, 45, 46 47	53, 54, 56 58	60, 62, 63 64, 66, 67

11.6. Participant E

11.6.1. Interview 1

The following sub-dimensions of variation could be determined in the first interview.

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
1, 2, 4, 5	10, 11, 12 13, 16	20, 24, 25, 28	36, 37	44, 45, 49	-	63, 64, 66 69

11.6.2. Interview 2

The following sub-dimensions of variation could be determined in the second interview

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
1, 2, 3, 4	11, 12, 13 14	19, 20, 22 23, 24, 25 26, 27, 28 29, 30, 32	35, 37	44	54	63, 64, 66

11.7. Participant F

11.7.1. Interview 1

The following sub-dimensions of variation could be determined in the first interview.

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
1, 2, 3, 4 7,9	12, 13 14, 16, 17,18	27 28 29 32	35, 39 41, 42	44, 45, 46, 47, 48 49, 51, 52	54, 56, 57, 58	66, 68, 69

11.7.2. Interview 2

The following sub-dimensions of variation could be determined in the second interview

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
2, 7, 8, 9	11, 12, 13 15, 16, 17 18	19, 20, 24 25, 27, 28 30, 31	36, 37, 38 39, 41, 43	44, 46, 48 49, 52	53, 54, 55 56, 57, 58 59	63, 66 67, 69, 70

11.8. Participant G

11.8.1. Interview 1

The following sub-dimensions of variation could be determined in the first interview.

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
2, 4, 7	12, 13, 15 16, 18	23, 26, 27 28, 30, 31 32, 33	34, 35	46, 47, 49	53	63, 69

11.8.2. Interview 2

The following sub-dimensions of variation could be determined in the second interview

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
1, 2, 3, 4 6, 7	10, 11, 12 13, 14, 15 17, 18	20, 21, 22 23, 25, 26 27, 28, 30 31, 32, 33	35, 41	44, 46, 47 49, 51	53, 54, 56 57, 58, 59	66, 68, 69

11.9 Summary

The findings above give the Dimensions of Variation discernable in the transcripts of both interviews for each of the 7 Stage 2 participants.

The next chapter will offer an analysis and interpretation of these findings.

What has been the effect of the module on the participant and how can we interpret this in terms of the Participant's Information Literacy experiences and the strengths and weaknesses of the module?

Chapter 12

Analysis and Conclusions from Stage 2

12.1. Introduction

Aim 4 of the study is:

To analyse the information literacy development process in nurses with a view to practical application and improvement of outcomes.

This chapter addresses questions first listed in Section 10.1 based on Aim 4:

- Can expansion in an individual's Information Literacy experiences as a result of an educational intervention be mapped, in terms of their range and complexity?
- Can the value of an Information Literacy education intervention be audited, in terms of its ability to expand the range and complexity of experiences?

by interpreting the data from Chapter 11 in order to address the following indicative questions:

a. What is the effect of the module on the Participant in terms of range and complexity of experience of Information Literacy?

For each participant, new sub-Dimensions of Variation were looked for by analysing the transcript of the second interview and comparing it with the first.

i. Range of experiences

Could the capacity for an increased range of experiences of Information Literacy, indicated by new sub-dimensions of variation in the second interview transcript, be determined and sensibly interpreted?

ii. *Complexity of experiences*

What can be determined about increases in the complexity of the Participant's experience of Information Literacy after the module? How can they be interpreted?

Further insight into the effect on the participant of the module was obtained by looking at the new sub-Dimensions of Variation from a slightly different perspective: whether each participant was able to operate at higher Categories of Description after the module. Did significant numbers of new sub-Dimensions come from Categories of Description E and F?

b. *What are the strengths and weaknesses of the module?*

An analysis of the new sub-dimensions of variation of the participant group as a whole.

i. How well is the module capable of extending the range of Information Literacy experiences? Under which Themes of Expanding Awareness are the newly acquired sub-Dimensions of Variation of the Stage 2 cohort as a whole, grouped; which Themes are particularly re-enforced and why? Which Themes are not, and why?

ii. How well is the module capable of increasing the complexity of Information Literacy experience? Which Categories of Description are strengthened by the module? Which Categories are the new sub-dimensions for the Stage 2 cohort as a whole, grouped under? Which Categories are thereby re-enforced by the module and why? Which Categories are not, and why?

Question a will be addressed in Sections 12.2 to 12.9, with each participant analysed in turn. Question b will be addressed in Section 12.10.

Reliability

In addition, each Participant's outcomes are analysed for Reliability. As well as new Dimensions of Variation, analysis of the second interview should still yield those found through the first. Åkerlind (2008) indicates the Information Literacy education is a process of expansion of Information Literacy experience not replacement. If the method of Stage 2 of the study can be said to have Reliability, then the second interview should consistently report the same Dimensions as found in the first interview, with allowances for accountable distorting circumstances.

12.2. The Experiences of Participant A

i. Range of experiences

The following sub-dimensions were present in the first interview. Their definitions are quoted again to assist with interpretation.

- 2. Establishing knowledge of, and understanding of, current practice and associate issues
- 22. Attempting to improve individual outcomes
- 24. Developing up-to-date- practice
- 32. Facilitating patient safety
- 37. Keeping up to date with the current evidence relevant to your job
- 41. Auditing practice
- 48. Finding all or sufficient evidence
- 49. Critiquing relevant evidence effectively
- 54. Having knowledge of correct / credible sources/databases
- 57. Having knowledge of MeSH subject headings, textwords and how they can be used
- 66. An experience of information as...Evidence to inform practice
- 69. An experience of information as...A means to facilitate change

The following sub-dimensions were 'new' in the second interview:

- 3. Showing competence in day to day work
- 5. Progressing professionally. Becoming a Lifelong learner
- 7. Becoming able to function non-dependently within the team

- 12. Functioning as part of the multi-disciplinary team
- 17. Become a patient advocate
- 20. Contributing evidence and other information to the Multidisciplinary team.
- 21. Determining the most cost-effective/efficient treatment option
- 23. Attempting to 'improve my practice'
- 25. Developing objectively proven/ justifiable best practice
- 27. Developing rationales for change
- 33. Achieving optimum and so ethically defensible care
- 40. Allowing an objective, evidentiary underpinning for practice
- 47. Structuring evidence searches effectively
- 56. Having knowledge of database/ information source structure and functions
- 58. Having knowledge of the structuring of searches
- 63. An experience of information as...Clinical guidelines, protocols and care bundles

Compared to some other participants, there was only a moderate number of new sub-dimensions. The participant was one particularly difficult to help engage with the module.

Theme 2 (relationships) is entirely new in the second interview and Theme 1 (professional self-development) has also been developed to some extent.

Theme 3 (Best practice) has been very markedly developed compared to the others. Considering the link between Best Practice and use of research and other evidence, perhaps development of this Theme is due to, or is in a mutually supportive relationship with, the small but significant development

of Theme 6, in which knowledge of the principles of evidence gathering is the focus? There was some further development in experiences in the general context of searching for appropriate evidence (sub-dimensions 47, 56 and 58 reinforcing 48, 49, 54, 57, 66 from the first interview). This could conceivably contribute to best practice but perhaps also, for this participant, aid in the enriching of professional competence and so a greater ability to contribute to the team – which in turn could contribute to awareness of Information Literacy's role in developing best practice.

ii. Complexity of experiences

The numbered Sub-dimensions of variation identified in each interview for this Participant (given in Chapter 11) are now each identified by the Category of Description of which they form part.

Interview 1:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. B	-	Cat. C	Cat. B	Cat. D	Cat. A	Cat. E
		Cat. D	Cat. E	Cat. E	Cat. D	Cat. F
		Cat. F				

Interview 2:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. B	Cat. C	Cat. A	Cat. B	Cat. C	Cat. A	Cat. C
Cat. C	Cat. F	Cat. B	Cat. D	Cat. E	Cat. C	Cat. E
Cat. D		Cat. C			Cat. D	Cat. F
Cat. E		Cat. C			Cat. E	
		Cat. D				
		Cat. D				
		Cat. D				
		Cat. F				
		Cat. F				

Looking at each Theme, and the sub-dimensions in them which are components of higher categories: 2 themes have Fs and 3 have Es in the first interview; 3 have Fs and 4 have Es in the second. Only a small improvement. New sub-dimensions of variation at Category F in Themes 2 and 3 only, suggest Information Literacy in its role in developing knowledge needed for ethical and patient focused care has a relation to operating at the highest levels of awareness in professional relationships. Can it be stated as proven that complex forms of care require Information Literate leadership? There is probably insufficient evidence here to back up such a statement.

Reliability

10 of the 12 sub-dimensions from the first interview appeared in the second. The two that didn't were: 41 and 48. The reliability of the method would therefore be regarded as reasonably high from this evidence.

12.3. The Experiences of Participant B

i. Range of experiences

The following sub-dimensions were present in the first interview:

- 5. Progressing professionally. Becoming a Lifelong learner
- 11. Sharing information with patients, colleagues and other professionals
- 12. Functioning as part of the multi-disciplinary team
- 13. Creating trust in you in others
- 16. Functioning as a teacher for junior colleagues and other members of the team
- 17. Become a patient advocate
- 20. Contributing evidence and other information to the Multidisciplinary team.
- 24. Developing up-to-date- practice
- 32. Facilitating patient safety
- 42. Developing of protocols and guidelines
- 46. Practising time efficient information gathering
- 51. Gathering evidence effectively for a team, or group project: guideline development or policy change
- 55. Having an understanding of the complexities, meanings and structures of medical information and research evidence
- 63. An experience of information as...Clinical guidelines, protocols and care bundles
- 67. An experience of information as...A means of developing relationships

The following sub-dimensions were 'new' in the second interview:

1. Investigating newly encountered clinical conditions/situations
3. Showing competence in day to day work
18. Fulfil a leadership role within the team
23. Attempting to 'improve my practice'
27. Developing rationales for change
28. Developing a culture of change within the ward
35. Matching evidence to a very specific clinical context or specific patient
37. Keeping up to date with the current evidence relevant to your job
38. Contextualizing of evidence by judgement and knowledge / Allowing judgement and knowledge to evolve in light of awareness of evidence
47. Structuring evidence searches effectively
53. Having knowledge of information types
54. Having knowledge of correct / credible sources/databases
56. Having knowledge of database/ information source structure and functions
57. Having knowledge of MeSH subject headings, textwords and how they can be used
58. Having knowledge of the structuring of searches
59. Understanding how to respond to an information need
60. An experience of information as...Basic clinical and scientific knowledge of a condition
64. An experience of information as... a means of understanding a newly encountered clinical problem or phenomenon
66. An experience of information as...Evidence to inform practice
69. An experience of information as...A means to facilitate change

This Participant was an experienced and highly educated senior nurse.

However it remained useful to see what effect the module had on someone who had significant knowledge and experience.

Additional complex experiences have been added to, especially in leadership (18) and the promotion of change (27, 28, 69). A significant range of new sub-dimensions associated with developments in evidence searching techniques (47. 53. 54. 56. 57. 58. 59) and an improvement in practice (3, 23, 27, 35, 37) were detectable. Is there a relationship between improvement in searching techniques and a greater facility to promote change, leadership and improve practice? The value of both Information Literacy and EBP would be proved if a larger study were able to confirm this.

The likelihood of such a relationship is re-enforced when it is noted that the only Themes that showed a marked increase in the range of experiences were Themes 4, 6 and 7 (*concepts of EBP; concepts of information gathering; conceptions of information*).

ii. Complexity of experiences

The numbered Sub-dimensions of variation identified in each interview for this Participant (given in Chapter 11) are now each identified by the Category of Description of which they form part.

Interview 1:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. D	Cat. B	Cat. B	Cat. E	Cat. C	Cat. B	Cat. C
	Cat. C	Cat. D		Cat. E		Cat. E

	Cat. D	Cat. F				
	Cat. E					
	Cat. F					

Interview 2:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. A	Cat. B	Cat. C	Cat. B	Cat. C	Cat. A	Cat. A
Cat. C	Cat. C	Cat. D	Cat. B	Cat. C	Cat. A	Cat. C
Cat. D	Cat. D	Cat. D	Cat. C	Cat. E	Cat. C	Cat. D
	Cat. E	Cat. E	Cat. E		Cat. D	Cat. E
	Cat. F	Cat. F			Cat. E	Cat. E
					Cat. F	Cat. F

2 themes have Fs and 4Es in the first interview, with 4 with Fs and 6 with Es in the second interview. This suggests that even this experienced participant was able to operate at higher Categories of Description after the module; but it is noticeable that the new higher dimensions are limited to Themes 6: *concepts of information gathering* and 7: *conceptions of information* – perhaps themes in which sophisticated experiences are most rapidly and easily developed by the module – those directly addressed by it.

Reliability

12 of the 15 sub-dimensions from the first interview appeared in the second. The three that didn't were: 17. 20 and 55.

12.4. The Experiences of Participant C

i. Range of experiences

The following sub-dimensions were present in the first interview

- 1 Investigating newly encountered clinical conditions/situations
2. Establishing knowledge of, and understanding of, current practice and associate issues
5. Progressing professionally. Becoming a Lifelong learner
12. Functioning as part of the multi-disciplinary team
13. Creating trust in you in others
14. Being seen to be accountable for actions
15. Achieving autonomy and status within the team
17. Become a patient advocate
19. Obtaining sufficient background psychosociocultural background knowledge on a patient
24. Developing up-to-date- practice
25. Developing objectively proven/ justifiable best practice
32. Facilitating patient safety
46. Practising time efficient information gathering
48. Finding all or sufficient evidence
53. Having knowledge of information types
54. Having knowledge of correct / credible sources/databases
60. An experience of information as...Basic clinical and scientific knowledge of a condition

The following sub-dimensions were 'new' in the second interview:

- 4. Feeling confident in one's role
- 7. Becoming able to function non-dependently within the team
- 11. Sharing information with patients, colleagues and other professionals
- 16. Functioning as a teacher for junior colleagues and other members of the team
- 21. Determining the most cost-effective/efficient treatment option
- 23. Attempting to 'improve my practice'
- 27. Developing rationales for change
- 29. Developing a culture of accountability to patients
- 31. Exploring the parameters of compassionate care
- 33. Achieving optimum and so ethically defensible care
- 35. Matching evidence to a very specific clinical context or specific patient
- 37. Keeping up to date with the current evidence relevant to your job
- 38. Contextualizing of evidence by judgement and knowledge / Allowing judgement and knowledge to evolve in light of awareness of evidence
- 40. Allowing an objective, evidentiary underpinning for practice
- 41. Auditing practice
- 43. Allowing experience and evidence to create an integrated mutually informing basis for practice
- 44. Negotiating the technology
- 47. Structuring evidence searches effectively
- 49. Critiquing relevant evidence effectively
- 51. Gathering evidence effectively for a team, or group project: guideline development or policy change
- 52. Having 'clarity of purpose and action' when gathering evidence

- 57. Having knowledge of MeSH subject headings, textwords and how they can be used
- 58. Having knowledge of the structuring of searches
- 59. Understanding how to respond to an information need
- 65. An experience of information as...A means to enable deeper investigation
- 66. An experience of information as...Evidence to inform practice
- 67. An experience of information as...A means of developing relationships

The full development of Theme 4 (Understandings and Experiences of EBP) – non-existent in the first Interview – is very marked. Participant C, although aware of EBP, came to experience information Literacy in that context after the module, having, it seems, no such experience before.

This participant began with experiences of Information Literacy that operated in the context of her keen interest in doing the best for patients and protecting them (1,2,13,14,17,19,32). She exhibited a very professional and focused approach, being supportable of and accountable to her team as well as patients (12, 14, 17). Information Literacy appeared to be a key aspect of her approach, with an emphasis on knowledge of information types and sources, with an emphasis on best use of limited time.

After the module, the focus on accountability to patients was reinforced and deepened (29, 31, 33) with a new emphasis on aspects of change management (23, 27, 37, 40, 41, 51, 65). All of this in the context of an expanding level of self-confidence (4, 7, 11, 16, 52, 59, 67). It could be

hypothesised that the tendency to focus on changing practice is a direct result of both self-confidence and focus on patient accountability.

ii. Complexity of experiences

The numbered Sub-dimensions of variation identified in each interview for this Participant (given in Chapter 11) are now each identified by the Category of Description of which they form part.

Interview 1:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. A	Cat. C	Cat. A		Cat. C	Cat. A	Cat. A
Cat. B	Cat. D	Cat. D		Cat. D	Cat. A	
Cat. D	Cat. D	Cat. D				
	Cat. D	Cat. F				
	Cat. F					

Interview 2:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. A	Cat. B	Cat. A	Cat. B	Cat. A	Cat. A	Cat. A
Cat. B	Cat. D	Cat. A	Cat. B	Cat. C	Cat. A	Cat. D
Cat. D	Cat. D	Cat. C	Cat. C	Cat. C	Cat. A	Cat. E
Cat. D	Cat. E	Cat. D	Cat. D	Cat. D	Cat. D	Cat. E
Cat. E	Cat. F	Cat. D	Cat. E	Cat. E	Cat. E	
		Cat. D	Cat. F	Cat. E	Cat. F	
		Cat. E		Cat. F		

		Cat. F				
		Cat. F				
		Cat. F				

Looking at each Theme, and the presence of sub-dimensions in them which are components of the higher categories, we find that 2 themes have Fs and none have Es in the first interview, with 5 with Fs and 7 with Es in the second interview. Clearly a considerable development.

Themes 6 and 7 moved from the lowest levels of experience to experience at the higher categories, perhaps helping to develop the aspects of experience under Theme 4. It will be recalled that this connection between Themes 4, 6 and 7 was prominent in Participant B also. Logically, a complex experiencing of the role of information literacy in the application of evidence to practice is connected to a similarly complex experience of principles and concepts behind evidence and other information gathering and knowledge of the kinds of information of relevance. It is therefore not surprising to find Theme 5 'Skills and Processes of evidence and other information gathering', has also been significantly developed to yield experience at the higher categories.

Reliability

15 of the 17 sub-dimensions from the first interview appeared in the second. The two that didn't were: 12. and 14. A reasonable level of Reliability can be recorded from this Participant's interviews.

12.5. The Experiences of Participant D

i. Range of experiences

The following sub-dimensions were present in the first interview:

- 2. Establishing knowledge of, and understanding of, current practice and associate issues
- 4. Feeling confident in one's role
- 10. Receiving information from patients, colleagues and other professionals
- 11. Sharing information with patients, colleagues and other professionals
- 24. Developing up-to-date- practice
- 25. Developing objectively proven/ justifiable best practice
- 35. Matching evidence to a very specific clinical context or specific patient
- 44. Negotiating the technology
- 46. Practising time efficient information gathering
- 47. Structuring evidence searches effectively
- 57. Having knowledge of MeSH subject headings, textwords and how they can be used
- 66. An experience of information as...Evidence to inform practice

The following sub-dimensions were 'new' in the second interview:

- 1. Investigating newly encountered clinical conditions/situations
- 3. Showing competence in day to day work
- 5. Progressing professionally. Becoming a Lifelong learner

12. Functioning as part of the multi-disciplinary team
13. Creating trust in you in others
17. Become a patient advocate
20. Contributing evidence and other information to the Multidisciplinary team.
21. Determining the most cost-effective/efficient treatment option
23. Attempting to 'improve my practice'
30. Developing an evidence-based ward culture
37. Keeping up to date with the current evidence relevant to your job
40. Allowing an objective, evidentiary underpinning for practice
45. Knowing how to use a library/ Library resource website
53. Having knowledge of information types
54. Having knowledge of correct / credible sources/databases
56. Having knowledge of database/ information source structure and functions
58. Having knowledge of the structuring of searches
60. An experience of information as...Basic clinical and scientific knowledge of a condition
62. An experience of information as...Data generated from patients (or via colleagues) and the clinical situation
63. An experience of information as...Clinical guidelines, protocols and care bundles
64. An experience of information as... a means of understanding a newly encountered clinical problem or phenomenon
67. An experience of information as...A means of developing relationships

The participant acknowledged her 'weak' information gathering skills in the first interview, although the presence of sub-dimensions 46 and 47 in that interview suggested this may have been a matter of low confidence.

'Teamwork' is emphasised in many of the new sub-dimensions (12, 20, 30, 67), suggesting that the student has not made large increases in self-confidence and is more comfortable using new information skills and knowledge as part of the team. A significant number of new themes can, indeed, be described as 'knowledge based' (45,53,54,56,58,60,62,63,64,67). Perhaps the module is still able to help develop the mutual 'social' aspect of information literacy in participants who express a fear of the technicalities of searching? Being part of an 'Information Literate team' may require less emphasis on individual information searching abilities.

ii. Complexity of experiences

The numbered Sub-dimensions of variation identified in each interview for this Participant (given in Chapter 11) are now each identified by the Category of Description of which they form part.

Interview 1:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. B	Cat. A	Cat. D	Cat. B	Cat. A	Cat. D	Cat. E
Cat. D	Cat. B	Cat. D		Cat. B		
				Cat. C		
				Cat. C		

Interview 2:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. A	Cat. A	Cat. A	Cat. B	Cat. A	Cat. A	Cat. A
Cat. B	Cat. B	Cat. B	Cat. D	Cat. B	Cat. A	Cat. B
Cat. C	Cat. C	Cat. C		Cat. C	Cat. C	Cat. C
Cat. D	Cat. D	Cat. D		Cat. C	Cat. E	Cat. D
Cat. D	Cat. F	Cat. D				Cat. E
		Cat. E				Cat. E

Looking at each Theme, and the presence of sub-dimensions in them which are components of the higher categories, we find that no themes have Fs and one has an E in the first interview, with 1 with an F and 3 with Es in the second interview.

Participant D was clearly a 'weak' Participant, with little ability to operate at the higher Categories; however the module has made a significant difference in Theme 2 especially: *development and maintenance of Relationships with patients, patients' families, colleagues and other professionals*. The parallel significant development of Themes 6 and 7 both knowledge-based themes reinforces the perception that this participant saw information application as part of a team effort. However, Theme 5: *Skills and Processes of evidence and other information gathering* remains undeveloped and unchanged at the higher categories in a Participant who continues to lack confidence.

Reliability

10 of the 12 sub-dimensions from the first interview appeared in the second.

The two that didn't were: 35 and 57. This outcome give further evidence of the 'reliability' of this method.

12.6. The Experiences of Participant E

i. Range of experiences

The following sub-dimensions were present in the first interview:

1. Investigating newly encountered clinical conditions/situations
2. Establishing knowledge of, and understanding of, current practice and associated issues
4. Feeling confident in one's role
5. Progressing professionally. Becoming a Lifelong learner
10. Receiving information from patients, colleagues and other professionals
11. Sharing information with patients, colleagues and other professionals
12. Functioning as part of the multi-disciplinary team
13. Creating trust in you in others
16. Functioning as a teacher for junior colleagues and other members of the team
20. Contributing evidence and other information to the Multidisciplinary team.
24. Developing up-to-date- practice
25. Developing objectively proven/ justifiable best practice
28. Developing a culture of change within the ward
36. Using evidence to prompt additional, more detailed questions
37. Keeping up to date with the current evidence relevant to your job
44. Negotiating the technology
45. Knowing how to use a library/ Library resource website

- 49. Critiquing relevant evidence effectively
- 63. An experience of information as...Clinical guidelines, protocols and care bundles
- 64. An experience of information as... a means of understanding a newly encountered clinical problem or phenomenon
- 66. An experience of information as...Evidence to inform practice
- 69. An experience of information as...A means to facilitate change

The following sub-dimensions were 'new' in the second interview:

- 3. Showing competence in day to day work
- 14. Being seen to be accountable for actions
- 19. Obtaining sufficient background psychosociocultural background knowledge on a patient
- 22. Attempting to improve individual outcomes
- 23. Attempting to 'improve my practice'
- 26. Suggesting a change in practice
- 27. Developing rationales for change
- 29. Developing a culture of accountability to patients
- 30. Developing an evidence-based ward culture
- 32. Facilitating patient safety
- 35. Matching evidence to a very specific clinical context or specific patient
- 54 Having knowledge of correct / credible sources/databases

From her comments, this participant seemed to have had a somewhat negative experience with the module, feeling uncomfortable with its methods and its ultimate value and somewhat guilty about not appreciating it. The second interview was limited in expansiveness, which may account for the significantly larger numbers of sub-dimensions not present in the second interview which were present in the first. The implications are significant: the interviewee must be engaged and relaxed enough to give a true picture of her or his experience of the phenomenon. This is supported by Ashworth and Lucas (2000) and others.

Those sub-dimensions that were new in the second interview showed an expansion in information literacy in the context of improvement/change in practice (22,23,26,27,30), and in patient-focused concerns and activities (14,19,22,29,32,35) which are clearly linked.

ii. Complexity of experiences

The numbered Sub-dimensions of variation identified in each interview for this Participant (given in Chapter 11) are now each identified by the Category of Description of which they form part.

Interview 1:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. A	Cat. A	Cat. B	Cat. B	Cat. A	-	Cat. C
Cat. B	Cat. B	Cat. D	Cat. B	Cat. B		Cat. D
Cat. D	Cat. C	Cat. D		Cat. E		Cat. E
Cat. D	Cat. D	Cat. E				Cat. F
	Cat. E					

Interview 2:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. A	Cat. B	Cat. A	Cat. B	Cat. A	Cat. A	Cat. C
Cat. B	Cat. C	Cat. B	Cat. B			Cat. D
Cat. C	Cat. D	Cat. C				Cat. E
Cat. D	Cat. D	Cat. C				
		Cat. C				
		Cat. D				
		Cat. D				
		Cat. D				
		Cat. E				
		Cat. E				
		Cat. E				
		Cat. F				

In Interview 1 the Participant was experiencing 4 Es and one F in the seven themes. In the second interview there were only 2Es and 1F. As has been mentioned, the Participant may have not been able to describe all of her experiences in the second interview due to negative feelings about the module. She did, however make some observable progress, especially in Theme 3 relating to Best Practice (2 further Es and for the first time an F). This may be interpreted as the beginnings of a wider understanding of information's potential to improve patient outcomes.

Reliability

15 of the 22 sub-dimensions from the first interview appeared in the second.

The seven that didn't were: 5, 10, 16, 36, 45, 49, 69.

It could be hypothesised that as well as lack of new sub-dimensions or lack of higher levels of 'awareness' of the phenomenon in the varying themes, a poor level of 'reliability' - the failure of experiences in the first Interview being expressed in the second - could indicate that the participant was unable to engage with the module. After a poor experience, the Participant is uncomfortable and defensive – and so less communicative than in the previous interview.

Further investigation may shed light on the nature of that difficulty, and potential insights could be obtained that could be used in presentation and content changes to the module.

12.7. The Experiences of Participant F

i. Range of experiences

The following sub-dimensions were present in the first interview:

1. Investigating newly encountered clinical conditions/situations
2. Establishing knowledge of, and understanding of, current practice and associate issues
3. Showing competence in day to day work
4. Feeling confident in one's role
7. Becoming able to function non-dependently within the team
9. Developing a wider professional horizon
12. Functioning as part of the multi-disciplinary team
13. Creating trust in you in others
14. Being seen to be accountable for actions
16. Functioning as a teacher for junior colleagues and other members of the team
17. Become a patient advocate
18. Fulfil a leadership role within the team
27. Developing rationales for change
28. Developing a culture of change within the ward
29. Developing a culture of accountability to patients
32. Facilitating patient safety
35. Matching evidence to a very specific clinical context or specific patient
39. Allowing a scientific basis for practice
41. Auditing practice
42. Developing of protocols and guidelines

- 44. Negotiating the technology
- 45. Knowing how to use a library/ Library resource website
- 46. Practising time efficient information gathering
- 47. Structuring evidence searches effectively
- 48. Finding all or sufficient evidence
- 49. Critiquing relevant evidence effectively
- 51. Gathering evidence effectively for a team, or group project: guideline development or policy change
- 52. Having 'clarity of purpose and action' when gathering evidence
- 54. Having knowledge of correct / credible sources/databases
- 56. Having knowledge of database/ information source structure and functions
- 58. Having knowledge of the structuring of searches
- 66. An experience of information as...Evidence to inform practice
- 68. An experience of information as...Source to develop a guideline protocol or bundle
- 69. An experience of information as...A means to facilitate change

The following sub-dimensions were 'new' in the second interview:

- 8. Becoming innovative in practice
- 11. Sharing information with patients, colleagues and other professionals
- 15. Achieving autonomy and status within the team
- 19. Obtaining sufficient background psychosociocultural background knowledge on a patient
- 20. Contributing evidence and other information to the Multidisciplinary team.

- 24 Developing up-to-date- practice
- 25 Developing objectively proven/ justifiable best practice
- 30 Developing an evidence-based ward culture
- 31. Exploring the parameters of compassionate care
- 36 Using evidence to prompt additional, more detailed questions
- 37 Keeping up to date with the current evidence relevant to your job
- 38 Contextualizing of evidence by judgement and knowledge / Allowing judgement and knowledge to evolve in light of awareness of evidence
- 43. Allowing experience and evidence to create an integrated mutually informing basis for practice
- 53. Having knowledge of information types
- 55. Having an understanding of the complexities, meanings and structures of medical information and research evidence
- 59. Understanding how to respond to an information need
- 63 An experience of information as...Clinical guidelines, protocols and care bundles
- 67. An experience of information as...A means of developing relationships
- 70. An experience of information as...A means of developing a strategy or theory

A young nurse of considerable intelligence and enthusiasm, she expressed a sense of the value of EBP and of ability to locate appropriate evidence sources in the first interview.

The comparatively weak Theme 6 '*Understanding and Knowledge of the principles and concepts behind evidence and other information gathering*' is surprising in Interview 1. Perhaps her information gathering had been rather unreflective. The greater range of experience of information literacy under

this Theme after the module may be due to the module's overt discussion of IL. Themes 4 on EBP was the only other Theme in which the range of experiences was significantly increased. Perhaps a greater range of evidence gathering conceptual experiences will lead to a greater consciousness of Information Literacy's role in EBP?

ii. Complexity of experiences

The numbered Sub-dimensions of variation identified in each interview for this Participant (given in Chapter 11) are now each identified by the Category of Description of which they form part.

Interview 1:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. A	Cat. C	Cat. D	Cat. B	Cat. A	Cat. A	Cat. E
Cat. B	Cat. D	Cat. E	Cat. D	Cat. B	Cat. C	Cat. F
Cat. C	Cat. D	Cat. E	Cat. E	Cat. C	Cat. D	Cat. F
Cat. D	Cat. E	Cat. F	Cat. E	Cat. C	Cat. E	
Cat. E	Cat. F			Cat. D		
Cat. F	Cat. F			Cat. E		
				Cat. E		
				Cat. F		

Interview 2:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. B	Cat. B	Cat. A	Cat. B	Cat. A	Cat. A	Cat. C
Cat. B	Cat. C	Cat. B	Cat. B	Cat. C	Cat. A	Cat. D
Cat. F	Cat. D	Cat. D	Cat. C	Cat. D	Cat. B	Cat. E
Cat. F	Cat. D	Cat. D	Cat. D	Cat. E	Cat. C	Cat. E
	Cat. E	Cat. D	Cat. E	Cat. F	Cat. D	Cat. F
	Cat. F	Cat. E	Cat. F		Cat. E	Cat. F
	Cat. F	Cat. E			Cat. F	
		Cat. F				

In the first interview 7 Es and 5 Fs were recorded; in the second 6 Es and 7 Fs (a maximum). The module was able to generate new experiences of higher complexity (e.g. 31, 43, 59, 70) than she was capable of previously; sub-dimensions of the highest levels of awareness of Information Literacy. The module was able to assist the Participant to function almost completely in Category F, the most sophisticated level of experience of Information Literacy. Starting with an already high level of sophistication and with an enthusiastic attitude to Information Literacy, she was able to make even further progress. We may predict a successful future career for Participant F.

Reliability

13 of the 35 sub-dimensions from the first interview appeared in the second.

Those that didn't were: 1,3,4,8, 14, 29, 32, 35, 42,45, 47, 51, 68

This is low score. Participant F was particularly enthusiastic about the module and using research evidence in her work. It is possible that this resulted in the participant failing to concentrate on long standing experiences. This may, however, merely indicate that the second interview should have been longer and more thorough in order to elucidate all of the Participant's very complex and varied experiences.

12.8. The Experiences of Participant G

i. New sub-dimensions

The following sub-dimensions were present in the first interview:

- 2. Establishing knowledge of, and understanding of, current practice and associate issues
- 4. Feeling confident in one's role
- 7. Becoming able to function non-dependently within the team
- 12. Functioning as part of the multi-disciplinary team
- 13. Creating trust in you in others
- 15. Achieving autonomy and status within the team
- 16. Functioning as a teacher for junior colleagues and other members of the team
- 18. Fulfil a leadership role within the team
- 23. Attempting to 'improve my practice'
- 26. Suggesting a change in practice
- 27. Developing rationales for change
- 28. Developing a culture of change within the ward
- 30. Developing an evidence-based ward culture
- 31. Exploring the parameters of compassionate care
- 32. Facilitating patient safety
- 33. Achieving optimum and so ethically defensible care
- 34. Following guidelines, protocols and policy documents
- 35. Matching evidence to a very specific clinical context or specific patient
- 46. Practising time efficient information gathering

- 47. Structuring evidence searches effectively
- 49. Critiquing relevant evidence effectively
- 53. Having knowledge of information types
- 63. An experience of information as...Clinical guidelines, protocols and care bundles
- 69. An experience of information as...A means to facilitate change

The following sub-dimensions were 'new' in the second interview:

- 1. Investigating newly encountered clinical conditions/situations
- 3. Showing competence in day to day work
- 6. Becoming an adaptable, flexible and responsive professional
- 10. Receiving information from patients, colleagues and other professionals
- 11. Sharing information with patients, colleagues and other professionals
- 14. Being seen to be accountable for actions
- 17. Become a patient advocate
- 20. Contributing evidence and other information to the Multidisciplinary team.
- 21. Determining the most cost-effective/efficient treatment option
- 22. Attempting to improve individual outcomes
- 25. Developing objectively proven/ justifiable best practice
- 41. Auditing practice
- 44. Negotiating the technology
- 51. Gathering evidence effectively for a team, or group project: guideline development or policy change
- 54. Having knowledge of correct / credible sources/databases
- 56. Having knowledge of database/ information source structure and functions
- 57. Having knowledge of MeSH subject headings, textwords and how they can be used

- 58. Having knowledge of the structuring of searches
- 59. Understanding how to respond to an information need
- 66. An experience of information as...Evidence to inform practice
- 68. An experience of information as...Source to develop a guideline protocol or bundle

The significant number of new sub-dimensions in Theme 6 is again marked, this time in conjunction with Themes 1, 2 and 3. *Principles and concepts behind evidence and other information gathering* is again shown to be connected to expansion in the range of experiences in the contexts of Best practice (3), Professional relationships (2) and Professional self-development (1).

ii. Is the Participant operating at the higher 'Categories'?

The numbered Sub-dimensions of variation identified in each interview for this Participant (given in Chapter 11) are now each identified by the Category of Description of which they form part.

Interview 1:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. B	Cat. C	Cat. C	Cat. A	Cat. C	Cat. A	Cat. C
Cat. D	Cat. D	Cat. C	Cat. B	Cat. C		Cat. F
Cat. E	Cat. D	Cat. D		Cat. E		
	Cat. E	Cat. E				
	Cat. F	Cat. E				
		Cat. F				
		Cat. F				
		Cat. F				

Interview 2:

Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7
Cat. A	Cat. A	Cat. A	Cat. B	Cat. A	Cat. A	Cat. E
Cat. B	Cat. B	Cat. B	Cat. E	Cat. C	Cat. A	Cat. F
Cat. C	Cat. C	Cat. C		Cat. C	Cat. C	Cat. F
Cat. D	Cat. D	Cat. C		Cat. E	Cat. D	
Cat. E	Cat. D	Cat. C		Cat. E	Cat. E	
Cat. E	Cat. D	Cat. D			Cat. F	
	Cat. F	Cat. D				
	Cat. F	Cat. E				
		Cat. E				
		Cat. F				
		Cat. F				
		Cat. F				

An improvement from 4Es and 3Fs to 6Es and 4Fs

This shows a small but significant increase in sophistication in Information Literacy experiences.

Theme 6 (Understanding and Knowledge of the principles and concepts behind evidence and other information gathering) is, as for several others, the major development for this participant, moving from Category A to some Category F experience. Its frequent 'partner' Theme 4: *Information Literacy experienced within Understandings and Experiences of EBP* shows some development from B to E, however it started from a particularly weak position

as shown in the first interview. Several of the other Themes showed a strengthening of complex experience with more E and F sub-dimensions present.

Reliability

21 of the 24 sub-dimensions from the first interview appeared in the second. The three that didn't were: 16, 34, 63.

A significant level of reliability was shown.

12.9. Can expansion in the range and complexity of an individual's Information Literacy experiences be mapped?

Analysis of the data from the 7 Participants allowed a detectable and interpretable progression in Information Literacy development in terms of both range and complexity of experiences to be described, suggesting the methods applied had significant validity.

Range of Experiences

Some of the Themes, those with simple knowledge and skill components, seemed to be developed well and rapidly, with significant numbers of additional sub-dimensions detectable. Those which involved professional development and personal relationships not surprisingly showed less rapid development, but often with enough new sub-dimensions to allow developmental relationships between Themes to be suggested and interpreted.

Complexity of Experience

The intervention showed some ability to develop additional complex experience even in those Participants already capable of complex Information Literacy experiences. However the development was often small, which was to be expected in a short module at academic Level 4.

Reliability

Reliability could be shown to be acceptable, with examples of poor reliability accounted for by individual circumstances; circumstances which potentially undermine the reliability of phenomenographic interviews but could be

brought into consideration and ameliorated in future investigations. For example, one participant showed little progress due to lack of understanding of, and therefore lack of enthusiasm for and engagement with the module, which resulted in lack of engagement in the second interview. Engagement should be monitored and problems addressed.

The next section moves on to an analysis of the SEARCH module itself. Can the data from Stage 2 be used to analyse its ability to develop Information Literacy experiences, thereby implying that the Stage 2 method can potentially be used to audit educational interventions?

12.10. Strengths and Weaknesses of the Module

12.10.1. Overview

This section attempts to audit the strengths and weaknesses of the module by analysing together:

How frequently is each sub-dimension generated by the module?

How common is each sub-dimension after the module?

The second question is included to contextualize the former. Whether the new sub-dimensions and those sub-dimensions not developed by the module are now common (in the former case), were always common, or remain uncommon, may be significant.

The answers to these questions allow us to determine to what degree each Theme of Expanding Awareness and Category of Description is strengthened by the module to **determine its ability to increase breadth and complexity of experience of Information Literacy** respectively.

12.10.2. Data Analysis Structures for the Assessment of the Module

The analysis below is based on the following arrangement of the Stage 2 data. Again, each number refers to a corresponding sub-Dimension of Variation identified in Section 8.3.

How frequently is each sub-dimension generated by the module?

New in 7 Participants: None

New in 6 Participants: None

New in 5 Participants: 3, 23, 58

New in 4 Participants: 20, 21, 27, 37, 54, 56, 59

New in 3 Participants: 1, 11, 17, 25, 30, 35, 38, 40, 47, 53, 57, 63, 66, 67

New in 2 Participants: 5, 7, 12, 14, 19, 22, 29, 31, 33, 41, 3, 44, 51, 60, 64,

New in 1 Participant: 4, 6, 8, 10, 13, 15, 16, 18, 24, 26, 28, 32, 36, 45, 49,
52, 55, 62, 65, 68, 69, 70

New in no Participants: 2, 9, 34, 39, 42, 46, 48, 50, 61

How common is each sub-dimension after the module?

Common to 7 participants after the module: 12, 54, 66

Common to 6 participants: 1, 2, 3, 11, 13, 17, 20, 23, 24, 25, 27, 35, 37, 47,
57, 58, 63

Common to 5 participants: 4, 5, 16, 32, 44, 46, 49, 53, 56, 69

Common to 4 participants: 7, 14, 21, 28, 30, 41, 51, 59, 67

Common to 3 participants: 10, 15, 18, 19, 22, 29, 31, 33, 38, 40, 45, 48, 52,
60, 64

Common to 2 participants: 26, 36, 42, 43, 55, 68

Common to 1 participant: 6, 8, 9, 34, 39, 62, 65, 70

Common to no participants: 50, 61

(This includes sub-dimensions present in Interview 1 missing from Interview
2)

Criteria for Significance

In the analysis below, for '**new**' sub-dimensions, 'frequent' is defined as appearing in 4, 5 or 6 participants, with 3 as fairly frequent; 'infrequent' in 0 or 1 participants.

For '**common**' sub-dimensions after the module: 'common' is defined as appearing in 5, 6 or 7 participants; rare in 0, 1 or 2 participants.

The discrepancy between the groups of definitions is accounted for by the difference in the balance of frequency: as can be seen above, sub-dimensions are more likely to be common than new.

12.10.3. To What Degree is the Range of Information Literacy

Experience widened by the Module?

Theme 1: *Information Literacy experienced in processes of Professional Self development* - sub-dimensions 1-9

New: sub dimension 3 was developed frequently; 1 fairly frequently. 8 and 9 were infrequent.

Common: sub-dimensions 1, 2, 3 and 4, were common after the module; 6, 8 and 9 were rare.

Though lower level experiences were either already common or were developed by the module, the higher ones were not developed. Perhaps this Level 4 module, operating at low academic level, is less likely to develop experiences associated, in this theme, with high level professional status; something likely to take some time to develop in its more complex forms.

This lack of higher development appeared in other Themes, but the remarkable clarity of the phenomenon in this Theme perhaps shows that this is a aspect of Information Literacy which requires 'long-term development' more than any of the others.

Theme 2: *Information Literacy experienced in development and maintenance of*

Relationships with patients, patients' families, colleagues and other professionals - sub-dimensions 10-18

New: 17 was frequently developed; 11 fairly frequent. 10, 13, 16, were infrequent

Common: 11, 12, 13, 16, 17 were common after the module; 18 was rare.

This was a Theme in which the participants were already experiencing Information Literacy across several sub-dimensions. Only 1 of the sub-dimensions was rare after the Module despite its only moderate effect. Sub-dimension 17, however, 'becoming a patient advocate' was the one sub-dimension created frequently; perhaps a significant achievement for the module? Nurses work in teams, so the lack of rareness in the Theme to begin with is understandable. The module's only moderate effect here can perhaps be put down to the limited time (1-3 months) between the completion of the module and the second interview. Relationships take time to change.

Theme 3: *Information Literacy experienced through its role in Helping to achieve 'Best Practice'* sub-dimensions 19-33

New: 20, 21, 23 and 27, were developed frequently; 25 and 30 fairly frequently; 24, 26, 28 and 32 were infrequently developed.

Common: 20, 23, 24, 25, 27 and 32 were common after the module; 26 was rare

A Theme which was developed more than most, with 6 out of 15 sub-dimensions frequently developed or fairly frequent. That the module makes

significant contribution to Best practice is to its credit and strengthens the claim of Information Literacy to a significant role in Nursing practice.

27 stood out as a 'higher' sub-dimension which was frequently developed and became common: 'developing rationales for change' – something which requires a mastery of the research evidence, and therefore encouraging in terms of the value of the module as a whole. That 'facilitating Patient safety' (no. 32) was common before the module is to be expected (and reassuring).

Theme 4: *Information Literacy experienced within Understandings and Experiences of EBP* - sub-dimension 34-43

New: 37 was frequently developed; 35, 38 and 40 were fairly frequent. 34, 36, 39, and 43 were infrequently developed.

Common: 35, 37 were common after the module; 36, 39, 42, 34, 43 were rare after the module.

The module had only moderate effect in this Theme, despite there being room for improvement (few sub-dimensions were common and many rare even after the module). However, the key EBP sub-dimension 37: *Keeping up to date with the current evidence relevant to your job* was frequently developed and became common – an indication the module had at least some useful effect in this Theme.

A strengthening of the module might involve the use of clinical scenarios in which the value of applying research evidence to patient care is made explicit – something currently lacking. However it may be that development in this theme requires more time to show itself.

Theme 5: *Information Literacy experienced within application of*

Skills and Processes of evidence and other information gathering - sub-dimensions 44-52

New: No sub-dimensions were frequent; 47 was fairly frequent. 45, 46, 48, 49 50 and 52 were infrequent

Common: 44, 46, 47 and 49 were common; 50 was present in none but was the only rare sub-dimension

4 out of 9 dimensions were common after the module suggesting an already well-developed Theme. It may be that the skills learnt may take longer to 'integrate' into the participant's information literacy experiences. However 47 'Structuring evidence searches effectively' was fairly frequently new and common – something concentrated on heavily in Unit 3 of the module.

Theme 6: *Understanding and Knowledge of the principles and concepts*

behind evidence and other information gathering – sub-dimensions 53- 59

New: 58 was very frequently created; 54, 56, and 59 were frequent; 53 and 57 fairly frequent.

Common: 54 was common to all 7 participants; 53, 56, 57 and 58 were common. Only 55 was rare.

6 out of 7 sub-dimensions were frequently or fairly frequently created. The contrast between this theme and Theme 5 may support the hypothesis that skills require a greater period of time to become integrated into Information Literacy experiences than knowledge. Knowledge is more quickly taken up. Or perhaps the former are more difficult to acquire?

Theme 7: *Information Literacy experienced through Applicable conceptions of information* – sub-dimensions 60-70

New: Only 63, 66 and 67 were fairly frequent. 62, 65, 68, 69 and 70 were infrequent; 61 was not created at all.

Common: 66 appeared in all 7 participants; 63 and 69 were also common; 62, 65, 68 and 70 were uncommon; 61 did not appear in any of the participants.

The sub-dimensions in this field are all 'practice-based'. That is, the conceptions of information were grounded in their significance to practice. The module, although discussing types of information source, does not go on to describe their possible roles within practice except in a very general sense. This may account for the lack of major development in this Theme. However this may also be a theme which develops over a longer timeframe as the range of information sources learned about in the module come to have a 'practice significance' to the participants.

12.10.4. To What Degree is the Complexity of Information

Literacy Experience increased by the Module?

How are the 6 Categories of Description developed by the module? Is the development of Category E and F significant or minimal in comparison to the lower Categories? Does the module mainly develop the lower categories or the higher? The answers to these questions allows us to describe, as part of our Audit, the fundamental characteristics of the module's educational value and nature.

Section 8.6.1. gave the Dimensions of Variation associated with each Category. The description of each Theme of Expanding Awareness in Section 8.5 indicates which sub-dimensions are grouped under each Dimension of Variation.

Each Category's associated sub-dimensions are analysed in a similar way to the section above. Conclusions are drawn from how many of each Category's associated sub-dimensions are developed by the module or not developed, in the context of how common they are after the module.

Category A (sub-dimensions 1, 10, 19, 21, 34, 44, 53, 54, 60)

New: 21, 54, was frequently developed; 1 and 53 were fairly frequent; 10 infrequently developed, with 34 not developed in any.

Common: 54 occurred in the experiences of all seven participants; 1, 44 and 53 were common; 34 was rare.

Category A, the least 'sophisticated' of the Categories, is fairly strong in the Participants after the module, with 4 of its 9 sub-dimensions common; 3 of those 4 having been significantly developed by the module. It would be hoped that a Level 4 module is capable of developing Information Literacy experience at this most basic level.

The module appears to have strengthened Themes 1 and 6 (particularly 6) in the context of this Category. Does this suggest that the module develops Information Literacy in these themes, of personal and professional development, and understanding and knowledge of the concepts of evidence-gathering, when the experience of being Information Literate is in its 'least sophisticated' form? As shown above, Theme 1 is not common in

the higher Categories and Theme 6 is well developed overall, perhaps due to the speed at which 'knowledge' can be assimilated to experience.

Category B (sub-dimensions 2, 11, 20, 35, 36, 37, 45, 55, 61, 62)

New: 20 and 37 were frequent; 11 and 35 fairly frequent. 45, 55 and 62 were infrequent, with 2, 36 and 61 not created at all.

Common: 2, 11, 20 35, 37 were common; 36 and 62 rare; 61 absent entirely.

Similarly to category A, Category B is fairly strong after the module (5 out of 10 sub-dimensions common) but with greater evidence of the module having been effective in developing the Category (4 frequent or fairly frequently created out of 10). Themes 2, 3 and 4(to some extent) were both frequently developed and prominent after the module; different themes than in Category A – relationships, best practice and EBP rather than professional development and concepts of evidence-gathering. Is development in these themes more likely to promote at least slightly more complex information literacy experience?

Category C (sub-dimensions 3, 12, 22, 23, 26, 38, 46, 47, 56, 63)

New: 3, 23, 56 were frequent; 38, 47 and 63 fairly frequent. 26 was infrequent, 46 was not created at all

Common: 12 existed in all participants; 3, 23, 46, 47, 56 and 63 were also common; 26 was rare.

The module was effective in this Category, with 6 out of 10 sub-dimensions developed significantly and only two weakly. Overall, Category C is the strongest Category: 7 out of 10 sub-dimensions were common after the

module. Perhaps indicative of its 'average' status between the higher and lower categories, this category was the 'commonest' in the experience of the Participants after the module. Perhaps the one in which most people are likely to function most of the time.

Category D (sub-dimensions 4, 5, 13, 14, 15, 24, 25, 27, 39, 40, 48, 57, 64, 65)

New: 27 was frequently created; 25, 40 and 57 fairly frequent. 4, 13, 15 and 65 were infrequent; 24, 39 and 48 were new in none.

Common: 4, 5, 13, 24, 25, 27, 57 were common; 39 and 65 were rare.

The Category as a whole was less strong (7 out of 14 sub-dimensions) than C but still, like C, fairly commonly experienced - perhaps as was suggested above, this is to be expected in a category of 'average' status. It was less frequently developed (only 4 sub-dimensions out of 14 frequent or fairly frequently developed compared to 4 out of 10) than C. Perhaps this suggests that the module – a level 4 module – begins to struggle when asked to develop higher categories?

Category E (sub dimensions 6, 7, 16, 28, 29, 30, 41, 42, 49, 50, 51, 58, 66, 67)

New: 58 was frequently developed; 30, 41, 66 and 67 were fairly frequent. 6, 16, 28, 49 was infrequent; 42 and 50 were new in none.

Common: 66 was common to all; 16, 49 and 58, were common; 6 and 42 were rare; 50 appeared in none.

A comparatively rare category in the Participant group even after the module: 4 out of 14 sub-dimensions were common. Again, does the

rareness relate to the comparative high level of Information Literacy?

However 5 of the 14 sub-dimensions had some evidence of development, suggesting the module had a small but still significant ability to develop to this level.

Category F (sub-dimensions 8, 9, 17, 18, 31, 32, 33, 43, 52, 59, 68, 69, 70)

New: 17 and 59 were frequently developed; 8, 9, 18, 32, 43, 52, 68, 69, 70 were infrequent

Common: 17, 32, 69 were common; 8, 9, 68, 70 were rare.

This highest level category was poorly developed and, similarly to Category E, present in only a limited way in the group after the module with only 3 of its 13 sub-dimensions commonly found. This reinforces the hypothesis that the SEARCH module struggles to develop the higher Categories.

12.10.5. Summary

Meaningful findings could be obtained in relation to the questions under *b* in Section 12.1.

To What Degree is the Range of Information Literacy Experience widened by the Module?

In terms of the range of Information Literacy Experiences, Theme 6 *Principles and concepts of information gathering* and to a lesser extent Theme 3 *Best practice* were developed well after the module. The other Themes were less affected. It may well be that a follow-up interview after 6 months to a year would see some development in Themes which may require a slower and more complex Information Literacy development

process. Themes such as those which involve personal development or relationships are clearly less likely to change rapidly.

To What Degree is the Complexity of Information Literacy Experience increased by the Module?

The module's ability to develop Information Literacy experiences of varying complexity could be mapped in a way which could be interpreted, suggesting validity of the method.

There was no major development measured in more sophisticated experiences. This isn't surprising as the module is of low academic level and the second interviews were conducted (unavoidably) only after a short period of time.

There was only limited development of any one Category of Description; however each Category showed some development. Category C was the strongest category after the module with B, D and A also fairly strong. The two most sophisticated categories, E and F were the weakest. This can be explained by the module's content, appropriate to Academic Level 4, directed at first year pre-registration students.

These findings match those for individual Participants where development at the higher categories was not considerable, though discernible at the more 'sensitive' individual level, at least in some cases.

12.11. Implications of the Findings from Stage 2

The following findings from Stage 2 of the study could be put forward as the most significant as to its validity and reliability:

- Apparent increases in Information Literacy experiences in participants could be determined from analysis of the data and meaningfully described (that is, could be interpreted meaningfully). Increases which could be sensibly interpreted. This suggests validity in the method, and hence that Information Literacy development of Individual students can indeed be mapped.
- Similarly, the context and degree of the module's effectiveness could be assessed with meaningful interpretations put forward, suggesting a valid method for auditing educational interventions.
- Reliability appears high. Information experiences identified in the first interview were, to a high degree, identified in the second. Exceptions to this could be interpreted and potentially counteracted.

With respect to the first 2 points it was hypothesised that additional time would be required to see the full developmental consequences of the module. A meaningful interpretation of why some new experiences were immediately observable and others weren't was put forward. The ability to do this in a meaningful way added to the positive evidence for the validity of the method.

Summary and Conclusion

The findings from Stage 2 of the study indicate that it is possible to track the Information Literacy development process, and audit Information Literacy educational interventions, by means of an initial phenomenographic study of the population in question, followed by a re-analysis of the student after the intervention. It remains to be seen whether the re-analysis by means of a second interview is a practical option or whether another method could be adopted without reducing sensitivity and reliability.

The final chapter will discuss this issue further and put forward an alternative method, after summarising and discussing the significance of the main findings of the study in detail.

PART 4: CONCLUSION AND IMPLICATIONS

Chapter 13

Implications of the Study

13.1. Introduction

This chapter summarises the key findings of the study and their potential value and significance, in the context of:

- our understanding of Information Literacy in Nursing;
- how evidence-based Information Literacy Education in Nursing might be developed;
- new understandings of Information Literacy - including within professions of a certain type, an ethical dimension.

The chapter begins with a summary of Stage 1 findings. What is Information Literacy in Nursing? How is it experienced? Who might benefit from this knowledge?

The Chapter goes on to discuss the implications for Information Literacy education in Nursing of Stage 1 and Stage 2 findings. The structure and content of an evidence-based Information Literacy educational intervention sketched out in Chapter 9 is summarised. The significance of the findings from Stage 2 that suggest Information Literacy student progress could be tracked and the validity of Information Literacy educational interventions could be assessed is also discussed.

One of the Stage 1 findings which the author of the study found most interesting in its potential implications was an apparent ethical dimension to Information Literacy in Nursing. Such findings can be interpreted as implying that failure to find and apply all appropriate evidence to clinical practice

means that the ethical requirement to strive for 'best practice' at all times, to give the patient the best possible care, has been compromised. Section 13.4 discusses this previously unidentified context for Information Literacy at length.

Another potentially significant aspect of the findings of Stage 1 of the study derived from the observation that Information Literacy experience always appeared to have a contextual knowledge focus. Information Literacy seemed to be always experienced in terms of the specific knowledge and knowledge-informed decision-making ability and high level functionality it generates in a particular context. This appeared to support the approach to Information Literacy in Section 1.1, and the relational approach developed from previous phenomenographic research.

This, however, appeared to be contradicted by other studies into Information Literacy which suggested some experiences are purely functional. The penultimate section of this chapter suggests a way in which previous studies can be reconciled to this aspect of Stage 1 findings, and, with further confirmation from additional research, how the definition of Information Literacy could be amended in a helpful and meaningful way.

Finally, what future projects suggest themselves? The necessity of further developmental work and the value of future studies in other evidence-based professions is discussed.

13.2. The Parameters of Information Literacy in Nursing Practice

Aims 1 and 2 were:

- 1. To investigate how being Information Literate is experienced by nurses.*
- 2. To use the insights obtained to develop a description of the parameters of information literacy in Nursing, including those of its role and value in EBP.*

Seven Aspects of the Phenomenon

The study discovered that Information Literacy in Nursing was experienced in 7 contexts: that is, there are seven aspects of the phenomenon of Information Literacy as experienced in Nursing Practice.

One context explicitly involved EBP but others showed the several ways in which information (and research evidence in particular), was directly and indirectly used to inform best practice - for example, in developing important relationships and professional roles, and in personal and professional development.

The 7 contexts are:

1. Information Literacy experienced in processes of Professional Self development
2. Information Literacy experienced in development and maintenance of Relationships with patients, patients' families, colleagues and other professionals
3. Information Literacy experienced through its role in Helping to achieve 'Best Practice'
4. Information Literacy experienced within Understandings and Experiences of EBP

5. Information Literacy experienced within application of Skills and Processes of evidence and other information gathering
6. Information Literacy experienced in the context of an Understanding and Knowledge of the principles and concepts behind evidence and other information gathering
7. Information Literacy experienced through Applicable conceptions of information

Six Ways of Experiencing the Phenomenon

It was found that there were 6 variations in the ways of experiencing Information Literacy in Nursing. These 6 ways were related to each other by means of increasing complexity of experience (from A to F). The Categories from A to F representing an ever greater awareness of the phenomenon, an ever greater ability to experience the potentialities (Marton and Booth 1997; Åkerlind 2008) of Information Literacy in the context of Nursing, and so initiating the development of ever more complex knowledge and potential wisdom (re: Section 1.1.).

Each Category could be described by means of a 'persona' – a new departure in definition of Categories of Description, but one thought justified due to the 'professional role' context of the experiences. As Categories of Description are archetypal descriptions of ways of experiencing a phenomenon, in the context of an investigation into the Information Literacy experience of nurses it seemed logical that they should describe ways of 'being a nurse in the context of information use'.

A. The passive minimalist.

This category describes experiences of information literacy in which 'the facts' are obtained to deal with the immediate and simple issue or context. Passive information absorption occurs as frequently as information gathering; the latter may frequently be of the 'scavenging' type.

B. The knowledgeable goal achiever

This category describes a way of experiencing information literacy in which the nurse is focused on specific goals. Information is sought out, identified and applied in the context of specific clinical requirements; this is done in conjunction with a developing background knowledge which allows the nurse to know how to address these aims. Skills and relationships are developed with such goals in mind.

C. The focussed, competent and evolving professional

In this Category Information Literacy is experienced in processes of professional effectiveness and achieved functionality. This is governed by a widening awareness of the value of finding and applying evidence and the ability to do so in terms of what can be achieved in improved practice and patient outcome.

D. The confident and trusted promoter of justifiable change

Information Literacy is experienced as one of the means and stimuli of an incipient tendency to think abstractly and strategically and as a leader: confident, trusted and with that increasing grasp of the

parameters of practice which results in an understanding of the potential value of change and where and how it may usefully occur.

E. The Teacher and Promoter of an evidence-based culture

Information Literacy is experienced in contributions to the performing of roles in which a wider strategic focus is beginning to operate; evidence is skilfully obtained and applied towards the development of policy. A leading contribution is made to the development of an information rich culture, often in a teaching role, especially with junior staff.

F. The Leader, Philosopher and Strategist

The most sophisticated level of experience of Information Literacy operates in the context of the nurse as leader, through its part in the promotion of the development of the ability to think strategically and philosophically. The ethics of obtaining or failing to obtain the evidence for best practice, the relationship of evidence to knowledge and experience and the strategic use of evidence and other information are amongst the challenging contexts in which Information Literacy is experienced in this category.

The educational value of these findings is discussed in Section 13.3.

13.2.1. What Are the Implications?

What are the Potential Implications of these findings?

This is the first complete picture of how Information Literacy is experienced by nurses as a profession.

For Nursing

The findings of this study, in particular the wide range of Themes of Expanding Awareness and large number of Dimensions of Variation, seem to indicate that Information Literacy is a pervasive element within Nursing Practice; information use appears to play a role in many, even most, aspects of a Nurse's role. In fact Information Literacy seems to be essential to effective Nursing practice at whatever level.

This visible pervasiveness of Information Literacy's role, especially in Evidence based- practice, must become more widely known amongst Nursing managers, academics and the profession as a whole. Perhaps through a report for NICE (National Institute for Health and Care Excellence). The value of Information Literacy has begun to be recognised by such bodies as the Royal College of Nursing (2011), but nowhere does it seem to be regarded as an essential aspect of nursing practice and education. Perhaps this is the fundamental reason why nurses have historically failed to develop Information Literacy (Dee and Stanley 2005; Jacobs et al 2003; Pravikoff, 2005; 2006). Lack of significance has meant lack of interest in its parameters before now, and therefore Information Literacy education based on guesswork.

This failure is more likely to be combatted if the evidence of Information Literacy's importance does indeed become widely known, but also if educational interventions to promote Information Literacy are based on research evidence; something now possible with this study, and that the value of such interventions is measureable. Such interventions are more likely to be persuasive of both their significance and their value, and to find a place in pre-qualification and post-qualification education and training.

It must also be made more aware that Information Literacy, as the findings of this study suggest, can have a transformative effect on nursing practice. In Chapter 9 the following observation was made relating to an aspect of the evidence-based Information Literacy educational intervention described there: 'Theme 3 doesn't need to be limited to finding basic information on the patient but can contribute, that the nurse herself can contribute, to developing truly compassionate care.' Information Literacy development has the capacity to broaden the horizons of the professional to make her see that she is capable of making a more profound contribution to the work of her profession: in the context of nursing, to the culture of care in which she works and to the care and well-being of her patients.

For Librarians

It could also be argued that if an understanding of this key role of Information Literacy gains ground, the profile of library resources and librarians with the National Health Service could be raised even higher than it currently is. More funding for NHS Nursing Library services could be more effectively argued for. The findings may also assist librarians and libraries in more effectively focusing resource provision, based on an understanding of the tasks, roles and ambitions that Information Literacy can be seen to facilitate within Nursing.

A recent innovation in NHS Library services is the concept of the 'Clinical Librarian'. This is a new role for information professionals, in which they are brought into the heart of the EBP process, responding to clinical questions with relevant research evidence in the ward environment. Early studies

indicate a positive effect on clinical decision making (Brettle et al 2011). It may be the case that this study's findings are able to re-enforce the perceived value of Clinical Librarians and Hospital-based Library services through evidence of the pervasiveness of Information Literacy's role in Nursing. Clinical Librarians (and others) could become more 'proactive' by suggesting ways in which a nurse client may use evidence in ways unknown to her, but suggested to the librarian through knowledge of the seven Themes of expanding awareness and their Dimensions of variation.

But above all, of course, the findings can be used to develop evidence-based Information Literacy education – potentially more effective than current provision. This will be discussed in more detail below.

13.3. Evidence Based Information Literacy Education in Nursing

13.3.1. Introduction and Summary

The study attempted to use the findings of the phenomenographic investigation in Stage 1 to sketch out the structure of an Information Literacy intervention which was evidence based and, in Stage 2, to develop tools which could audit such interventions.

13.3.2. Towards an Information Literacy Module in Nursing

The Third Aim of the study was:

To use the parameters of Information Literacy in Nursing to develop an outline of the structure and content of an evidence-based Information Literacy educational intervention for nurses.

After applying Variation Theory to the findings of the Stage 1 of the study, what should an evidence-based Information Literacy module for nurses look like? The points raised in Chapter 9 can be summarised as follows:

1. Students must be educated into all contexts in which Information Literacy is experienced in Nursing as described in the Themes of Expanding Awareness. This must be in such a way that they are able to function at any level of sophistication, from Category A to Category F, as the clinical circumstance demands.
2. The 7 Themes of Expanding Awareness, containing and putting into relation the 'aspects of the phenomenon open to variation' (Åkerlind 2008; Runesson 2006) should be the basis of the structure of the module.

Learning activities are developed to re-enforce the experience of Information Literacy exhibited in the context of each Theme, taking the students from the simplest to the most complex Dimension of Variation.

3. As Variation Theory suggests, learning materials should be based on varying the level of awareness of IL's complexities and potentialities, expressed as Dimensions of Variation, within the Themes. Only 2 or 3 Themes should be varied for each activity, showing the potential relationships between them at varying sophistication levels. In other activities these Themes will remain unvaried while other Themes are varied.

The pairings described in Chapter 9 (Section 9.3.) - and others – should be used in the way described.

4. Marton and Tsui's (2004) guidelines to be applied to ensure the application of all four aspects of variation: *Contrast*; *Generalization*; *Separation* and *Fusion*, in the development of the learning material.

As has been described above, the value of an evidence-based information Literacy intervention lies in its likelihood of developing genuinely relevant abilities as it is based on the actual Information Literacy experiences of nurses. As a result of this, such an intervention is more likely to impress nurse educators as relevant and worth a place in training and curricula. The educational intervention described in Chapter 9 is a sketch only, giving the structural and educational principles of the module as well as some indication of the focus of the constituent learning material. The next stage

would be to construct and test the module - test it in using the tools described in the next section.

13.3.3. Evidence-Based Methods for Learning Material Quality Control and the Tracking of Student Progress

The fourth Aim of the study was:

To analyse the information literacy development process in nurses with a view to practical application and improvement of outcomes.

Analysing the Progress of Students

As we have seen, the Participants in Stage 2 were able to develop new Dimensions of Variation: Dimensions detectable in the second interview transcriptions not detectable in the first. In some cases these formed part of the 'higher' Categories of Description. In others, the new Dimensions meant that Themes of Expanding Awareness which had not been prominent in a participant's pre-module experience became more so – especially in those Themes such as 6 in which skills and knowledge are the focus of experience. It could be hypothesised that Dimensions focused on skills and knowledge are 'incorporated' into experience relatively quickly in comparison to other Dimensions which have a more 'social' focus.

Despite the small group of participants for Stage 2, the method employed, the identification of Dimensions of Variation and the tracking of their development, gave enough interpretable data to establish the claim that the progress of students in the expansion of Information Literacy experience can be tracked and even 'measured'. If this is the case, careful determination of

student weakness and progress could potentially lead to more focused interventions.

This has wider implications. ‘Proof’ of the value of educational interventions in Information Literacy could result in a stronger and more successful case being made within nursing education for the value of Information Literacy education – Stage 1 having made the case for the value of Information Literacy in Nursing and the possible evidence-based nature of such education. In fact there is no reason why this could not be equally significant in other fields than Information Literacy.

Auditing an Educational Intervention

Similarly, Stage 2 gave enough interpretable data to claim that the strengths and weakness of the SEARCH module could also be analysed through the identification and tracking of the development of Dimensions of Variation.

This offers hope that this method could be used to ‘audit’ other Information Literacy modules and interventions. Indeed any other educational intervention. Which Dimensions of Variation can be developed and so which Categories of Description are strengthened, which Themes of Expanding Awareness can be strengthened – that is, in what way can the module increase the range and complexity of Information Literacy experiences - seems to be discoverable from employment of the method in Stage 2.

Not surprisingly, as an academic level 4 module, it was weak in the development of the Dimensions associated with the ‘higher’ Categories.

Perhaps a more advanced module, with more complex and intellectually challenging learning material concentrating on the Dimensions of variation

of the higher Categories and their relationships, would be more effective. Strategic thinking, Leadership, Ethical care, and Practice ideals would make a fascinating context for higher level Information Literacy education.

Auditing of existing modules potentially leads to a knowledge base for the development of effective educational interventions from scratch. As technology advances, Information Literacy education will transform. The effective application of new technologies will be a key challenge for the future of Information Literacy education. If such technologies can be audited as to effectiveness then their rapid application can be promoted, and the future development of the technology guided.

Interviews or Questionnaires?

However, there is the apparently 'impractical' nature of the analysis methods as they stand. Interviewing each student before and after an intervention is hardly possible or desirable. Could the process be made more time and energy efficient by the replacement of interviews with carefully developed questionnaires based on the Findings from Stage 1? Although Phenomenography is usually an interview-based methodology, this applies to what could be described as the 'discovery' phase. Once Dimensions of Variation and Themes of Expanding Awareness are determined by an initial phenomenographic investigation, then a questionnaire could, it is proposed, be employed reasonably successfully if based on them. However, the questions would not be of a 'do you do this?' type but ones based on Entwistle's (1997) principle of 'tell me about your experiences'.

A draft of such a questionnaire is given below. The students is asked if experiences are familiar and asked to give examples. Each of the Sub-dimensions of each Theme is made the subject of a question asking for recognition of, and most importantly proof of, experiences.

The usual limits of 'self-reporting' apply, however the questions are very focussed and evidence-based and so are more likely to stimulate memories of all potential experiences. The participant could also be prepared via preliminary communications to reflect carefully on their experiences.

This would make a long questionnaire. Perhaps it would be more effective if given in stages and on-line to make it easier to complete.

Information Literacy Questionnaire

Let us know about your experiences in clinical practice, ones in which you've found, used and applied information in order to develop the knowledge you needed or the ability to make effective decisions. The information can be of any kind, from any source; it might include research evidence in the form of guidelines of journal articles; online information; from the hospital or through your own reading or even from colleagues or patients.

If any of the experiences described below are familiar – not just recently but in other previous clinical roles you may have had - then tick the box and give us a brief example.

1. Professional Role

Tell us about experiences of using Information in ways which have supported and developed your role

- ☒ Investigating newly encountered clinical conditions/situations

In what way?:

- ☒ Finding out about the latest developments in clinical practice

In what way?:

- ☒ Activities which led to you feeling particularly effective in your day to day work

In what way?:

- ☒ Activities which led to you feeling confident in your role

In what way?:

- Activities which helped towards progressing professionally or as part of your continuing education

In what way?:

- Activities which helped you feel you were more adaptable, flexible and responsive professional

In what way?:

- Activities which helped you feel able to function non-dependently within the team

In what way?:

- Activities which helped you feel you were able to be innovative in practice

In what way?:

- Activities which gave you a sense of a wider professional horizon

In what way?:

2. Your Relationships. Tell us about your experiences of finding and using information as an aspect of your relationships with colleagues, patients and their families. You may have found information for them or received it or shared it, or used it as part of a team project.

- Receiving information from patients, colleagues and other professionals

In what way?:

- Sharing information with patients, colleagues and other professionals

In what way?:

- Functioning as part of the multi-disciplinary team

In what way?:

- Creating trust in you in others

In what way?:

- Being seen to be accountable for actions

In what way?:

- Achieving autonomy and status within the team

In what way?:

- Functioning as a teacher for junior colleagues and other members of the team

In what way?:

- Becoming a patient advocate

In what way?:

- Fulfilling a leadership role within the team

In what way?:

3. Developing Best practice

Tell us about experiences in which you've used Information to achieve the best practice possible. This may be in day to day activities or part of something more long-term or large-scale.

- Obtaining sufficient background psycho-socio-cultural background knowledge on a patient

In what way?:

- Determining the most cost-effective/efficient treatment option

In what way?:

- Contributing evidence and other information to the Multidisciplinary team.

In what way?:

- Attempting to improve individual outcomes
In what way?:
- Attempting to 'improve my practice'
In what way?:
- Suggesting a change in practice
In what way?:
- Developing up-to-date- practice
In what way?:
- Developing practice that is recognised as objectively proven / justifiable
In what way?:
- Developing rationales for change
In what way?:
- Developing a culture of change within the ward
In what way?:
- Developing a culture of accountability to patients
In what way?:
- Developing an evidence-based ward culture
In what way?:
- Exploring the parameters of compassionate care
In what way?:
- Facilitating patient safety
In what way?:
- Achieving optimum and so ethically defensible care
In what way?:

4. EBP

Tell us about experiences where you've used research evidence to inform your own or your team's practice.

- Following guidelines, protocols and policy documents
In what way?:
- Matching evidence to a very specific clinical context or specific patient
In what way?:
- Using evidence to prompt additional, more detailed questions
In what way?:
- Keeping up to date with the current evidence relevant to your job
In what way?:
- Contextualizing of evidence by judgement and knowledge / Allowing judgement and knowledge to evolve in light of awareness of evidence
In what way?:
- Allowing a scientific basis for practice
In what way?:
- Allowing an objective, evidentiary underpinning for practice
In what way?:
- Auditing practice
In what way?:
- Developing of protocols and guidelines
In what way?:
- Allowing experience and evidence to create an integrated mutually informing basis for practice
In what way?:

5. Tell us about your experiences of Information gathering. Are any of these processes ones you have experience in; if so, give an example.

- Feeling competent in negotiating the technology

In what way?:

- Knowing how to use a library/ Library resource website

In what way?:

- Practising time efficient information gathering

In what way?:

- Structuring evidence searches effectively

In what way?:

- Finding all or sufficient evidence

In what way?:

- Critiquing relevant evidence effectively

In what way?:

- Gathering and applying key information within the ward environment

In what way?:

- Gathering evidence effectively for a team, or group project: guideline development or policy change

In what way?:

- Having 'clarity of purpose and action' when gathering evidence

In what way?:

6. Tell us whether the understandings of Information Described below are within your experience. If so, give us examples of how you've used this knowledge in practice.

- Having knowledge of information types

In what way?:

- Having knowledge of correct / credible sources/databases

In what way?:

- Having an understanding of the complexities, meanings and structures of medical information and research evidence

In what way?:

- Having knowledge of database/information source structure and functions

In what way?:

- Having knowledge of MeSH, subject headings, textwords and how they can be used

In what way?:

- Having knowledge of the structuring of searches

In what way?:

- Understanding how to respond to an information need

7. Tell us about experiences in which you've used Information of the following types:

- Basic clinical and scientific knowledge of a condition

In what way?:

- Statistical data

In what way?:

- Data generated from patients (or via colleagues) and the clinical situation

In what way?:

- Clinical guidelines, protocols and care bundles

In what way?:

- A means of understanding a newly encountered clinical problem or phenomenon

In what way?:

- A means to enable deeper investigation

In what way?:

- Evidence to inform practice

In what way?:

- A means of developing relationships

In what way?:

- Source to develop a guideline protocol or bundle

In what way?:

- A means to facilitate change

In what way?:

- A means of developing a strategy or theory

In what way?:

13.4. Information Literacy in the Evidence-Based Professions - The Ethical Imperative

13.4.1. A New Ethical Perspective for Information Literacy

This section discusses a key finding of the study: the apparent ethical necessity to be Information Literate in the evidence-based professions.

Previous discussions in the literature relating ethics and Information Literacy have been restricted to the ethical *use* of information.

13.4.2. Findings From Stage 1

In Stage 1, participants described experiences which seem to imply that not to seek out full knowledge of the patient's condition and make the greatest possible efforts to locate, critique and apply the methods of care that research indicated were the most effective, was to be ethically irresponsible.

The quotes below are intended to give a flavour of these experiences only.

As mentioned in Chapters 3, 4 and 7, the data analysis method implied a development of representative statements of experience across whole interviews and across several simultaneously; experiences, especially those in Information Literacy in the context of Nursing, cannot be reduced to short quotations. The relevant Dimensions and Sub-Dimensions of variation developed from this method are discussed in detail below.

‘....through necessity I have to follow EBP. It’s an ethical issue.’

Participant 3

‘most patients are vulnerable, are in a compromised situation – this is why you need ethics, accountability...and EBP to show that they are safeguarded.’ *Participant 3*

‘Patient safety is fundamental –everything that we do to them can be detrimental....we do have to keep up to date because everything we do [should be] based on sound evidence’ *Participant 1*

‘if you say it’s evidence-based you have the moral high-ground. It’s not just me –we have to do it’ *Participant 5*

‘.... it would be unethical not to keep up with your [Information skills], but I think with the best will in the world you’re always going to have the movers and shakers and the people who follow behind. So I think that as long as the people who haven’t got those skills or who are resistant to developing those skills are mixed in with the motivated people, I think that’s as good as you’re going to get, and that’s not ideal but...’ *Participant 36*

‘ [nurses need Information skills] so that they can keep up-to-date with current practice - because things that I learnt when I was a student nurse, things have been changed and tweaked and there’s evidence to say that what we were doing might not have been as effective as we say it is’
Participant 9

‘I think as a Registered General Nurse - as a nurse - I owe it to my patients to be doing the best for them which means [obtaining the] most up-to-date [evidence]. And I would feel that I was not doing my job - which I suppose is unethical[and] you can’t be giving old information out to patients because that could ruin their lives’ *Participant 19*

‘if somebody’s read about some whacky treatment where they’re paying a fortune and it’s not effective or proven to be effective, again we’re ethically

bound to make sure that that person is fully informed on the choices they're making really.' *Participant 35*

'EBP - people need to really understand not just that it's a term but actually the way that they engage with EBP [including how they develop and use Information skills] has far reaching effects and ... has ethical implications' *Participant 35*

'once you've built up a repertoire of available evidence..... it improves the patient's experience because what they're getting is not a one size fits all approach. They are getting something which is literally tailored to their particular set of circumstances from people who are thinking and enquiring' *Participant 7*

This ethical dimension was particularly emphasised in critical care environments in which operating without research evidence was to risk an outcome that was likely to be very serious.

As shown in Chapter 8, several dimensions and sub-dimensions of variation described in the findings of Stage 1 suggest such an ethical dimension to being Information Literate in Nursing.

Within Theme No.3, for example, the Dimension: *Developing an information supported ethical focus to care*, with its sub-dimensions:

- Exploring the parameters of compassionate care
- Facilitating patient safety
- Achieving optimum and so ethically defensible care.

A list of similar ethically focused sub-dimensions from throughout the seven Themes includes:

- Obtaining sufficient background psycho-socio-cultural background knowledge on a patient
- Developing a culture of accountability to patients
- Being seen to be accountable for actions
- Becoming a patient advocate
- Attempting to improve individual outcomes
- Attempting to 'improve my practice'
- Following guidelines, protocols and policy documents
- Matching evidence to a very specific clinical context or specific patient
- Using evidence to prompt additional, more detailed questions
- Keeping up to date with the current evidence relevant to your job
- Developing up-to-date- practice
- Establishing knowledge of, and understanding of, current practice and associate issues
- Showing competence in day to day work

All of these, it can be asserted, imply ethical actions in that they are focused on finding and using information to achieve optimum care. As a group they seem to imply that there is in Nursing

- an ethical necessity in the identifying and finding as well as the applying of research and other evidence to achieve the best possible care; the former being inseparable from the latter.
- a focus on acquiring the necessary personal and clinical information to sensitively determine the needs of the patient;

- an necessity to be accountable to patients and colleagues, in which information literacy provides the best possible knowledge contribution to the individual's care and the work of the team;
- an ongoing striving for professional competence in which Information Literacy has a key role in maintaining sufficient knowledge levels.

These can be summarised as:

1. The ethical requirement to achieve competence
but beyond this,
2. The ethical requirement to seek out and implement 'best practice'.

What is the broader significance of this?

13.4.3. Implications for the Evidence-Based Professions

In order to discuss the implications of these findings, it is necessary to take an overview of the context, specifically the concepts of 'Competence' and 'Best Practice' in which an ethical dimension to Information Literacy might function in those professions which have an ethical obligation to patients or clients. That is, (as the findings from Stage 1 show) the ethically determined obligation to function effectively and beyond that, the equally ethically determined ambition to function at the greatest possible effectiveness.

Competence

'Competence is the state of having the knowledge, judgement, skills, energy, experience and motivation required to respond adequately to the demands of one's professional responsibilities.' (Roach 1992, p.61)

In this definition of what constitutes professional competence, knowledge is listed first, and there may be some claim for it as being the fundamental basis of competence. Judgement is impaired, skills may be unusable, and energy misplaced without sufficient and appropriate knowledge and the information literacy that initiates the formation of that knowledge. Information Literacy's role in initiating the creation of knowledge was discussed in Section 1.1. and described in the Nursing context in the Stage 1 findings. A further definition of competence by Kitchener (2000) brings in the recognition of knowledge inadequacy (re: Pillar 1 of the SCONUL definition (SCONUL 2011)):

'Being competent involves having the knowledge, skills and abilities to perform one's professional role, and the ability to recognize when one's knowledge....[is] inadequate and impaired.' (Kitchener 2000 p.156)

But Nurses and other professionals are also autonomous individuals who have responsibility to move on from recognition of a problem in their practice to actively doing something about it (re: SCONUL Pillars 2 onwards (SCONUL 2011)). Evetts's (2006) definition of the professional as someone who works in knowledge based service occupations implies basic competence must involve the ability to be aware of a knowledge lack and be able to plan and execute an information search and identify locate and critique that information to create new knowledge. Not all 'Knowledge' is based on information sources. However Eraut (1994) considered the factors on which learning in professional practice relies and found 'publications' to be one of the three key ones.

The failure to use information skills to maintain competence has an ethical significance for all nurses, but also other professionals, not just those who

could potentially endanger the public by their incompetence. Undermining the work of colleagues and employers is a potential risk in any profession; failure, through operation from an incomplete or inappropriate information base, to provide value to money to clients, or to provide a service which they themselves rely on as correct and effective in the development of their own products and services may result in breach of trust or harm in one form or another. In the current study, the 'team approach' to information activities is something which emerged very strikingly. Groups within the nursing profession or groups which included other professionals (the 'multidisciplinary team') often worked together to maintain effective care and treatment by a joint effort to search for and critique relevant research or research-based documentation. Information Literacy was seen as a way of effectively contributing to the team and the work of other professional groups. Failure to do so, to undertake a role and not perform it based on the research evidence or other information relevant to that particular role in the team, potentially undermines the work of all, and the wellbeing of all of the patients or clients dealt with by the team.

Best Practice

In many professions such as Nursing, EBP has been accepted as a means of keeping practice at the highest level (Sackett et al.1997). In Nursing (Theme 4's Dimension: *Seeking evidence to integrate into existing knowledge and experience*) it involves integrating research evidence into the information gathered about a patient in the context of a nurse's experience, in order to determine what is likely to be the best care or treatment (Jacobs et al 2003).

This confirms the definitions of Craig and Stevens (2012), and of Gambrill (2007):

‘EBP describes a philosophy and process designed to forward effective use of professional judgment in integrating information regarding each client's unique characteristics, circumstances, preferences, actions, and external research findings.’ (Gambrill 2007, p.449).

EBP involves identifying, finding and applying research evidence - raw evidence or guidelines or other documents based on that evidence - as a means of discovering and implementing what has been proven to be safe, effective, but also the most effective practice. Essential knowledge is seen, not just in what has been accumulated over a career but what, objectively, the research indicates is the best way to act. Nursing and other professions have bred a huge research effort which looks into the best methods of care, the best treatments, the effectiveness or otherwise of medications.

Competence moves on from having the knowledge to do the job effectively, to a process of constantly improving practice based on new research evidence as it becomes available. Changing practice (e.g. as exhibited in the Theme 3 Dimension: *Developing strategies of justifiable change*) requires the ability to find and critique evidence and apply it to practice – creating a new way of working. EBP is seen as an ethical tool in the professions that deal with human health and welfare, not only to combat ill-informed practice but to combat harmful wider phenomena (For example Sub-dimension 32: *Facilitating patient safety*). Gambrill (2007) sets out in tabular format the *‘Contributions of EBP to Honoring Ethical Obligations’* and under *‘Help clients and avoid harm’* she places

‘Encourage use of and facilitate access to practice and policy related research findings to maximize the likelihood of success and minimize the likelihood of harm’ (Gambrill 2007, p.456)

(compare to, amongst others, Sub dimension 34: *Following guidelines, protocols and policy documents*); under the ethical obligation to be competent is placed *‘Possess knowledge of and effectively transmit up-to-date research findings regarding vital practice and policy questions.’*

(Gambrill 2007, p.457) – this can be compared to Theme 4 in the current study. ‘Use’, ‘facilitate access’, ‘possess knowledge of’ (i.e. identify, locate and critique, and ‘transmit’ are familiar terms from definitions of Information Literacy (SCONUL 2011) and can be traced in the findings from Stage 1.

The Role of Information Literacy

Knowledge, then (relevant information justifiably considered to be true. (Hoyt et al 2011)) is fundamental to ethical practice; that is, is the information base from which the professional is operating complete, in the sense that critical analysis has been applied to all potentially relevant information sources and ‘knowledge’ has been obtained? It could be hypothesised that if not, so that the paradigm-shifting research study, the key legal document or statistical analysis is missing, it could mean a failure of ‘knowledge’ and so inadequate treatment, advice or representation. Information Literacy involves not only understanding how to rectify this but also being able to determine that there are information sources which have yet to be incorporated into the ‘knowledge base’ (the pillar ‘Identify’ in the SCONUL seven pillars (SCONUL 2011). The Information Literate person will then ‘gather, use, manage,

synthesise and create information and data' (SCONUL, 2011) effectively to rectify this, so that true knowledge is the result.

The skills to use the information effectively may be a profound and fundamental part of a professional's practice. Some professions consist almost entirely of the ability to make use of specialist information.

Information Literacy, so often struggling to make itself acknowledged, has the potential to take centre stage in professions such as Law. Smith and Presser (2005), in their article on providing Information Literacy training for student lawyers, state that a whole range of key information-based activities such as legal reasoning, legal writing, adherence to copyright law, and avoidance of plagiarism, are essential to the effective modern lawyer - with the unstated implication that inability to competently perform those activities results in failure to serve the needs of the client and of the law itself.

The SCONUL definition of Information Literacy yields up other aspects of Information Literacy which can be viewed in the context of ethical professional behaviour. The ethical management of information implies that not only must it be kept confidential and treated as the private and personal thing it may be, but it must be easily available to those who may my need to access and apply it to avoid the information incompleteness already discussed. The 'Synthesis of information' aspect of Pillar 7 is the central activity of lawyers, of medical professionals, investors, academics.....Failure to do this effectively and create the legal brief, the treatment plan, the investment portfolio, the university course, is failure tout court.

As well as discussing the 'active' possession of the necessary information skills, the SCONUL definition is sensitive to the 'awareness' an individual has (or doesn't have) of the process of information gathering and use.

Information Literacy involves a consciousness of processes (and therefore whether the processes are successful) and therefore, contains an ability to make an ethical judgement relating to whether the very best is being done for the patient or client - by having obtained and synthesised the necessary and correct information sources. This draws in Themes 5, 6 and 7 in the findings from Stage 1: by application of *skills and processes of evidence and other information gathering*; functioning with *understanding and knowledge of the principles and concepts behind evidence and other information gathering*; and having *applicable conceptions of information*, the ethically successful status allowing a professional to make that judgement relating to whether the very best is being done for the patient is achieved.

Ethics, Information Literacy and EBP

Brody (2008) coined the concept 'Information naiveté': the unfounded belief that one's information skills are up to the job in hand, and therefore one is operating with full 'knowledge'. The situations which arise from Information naivety are ethical, and the core ethical issue, as Body states, is located in individuals taking action based on information accumulated and dispensed by the 'Information naïve'. Although most information naiveté has trivial consequences, in some contexts '*it can be fatal*' (Brody 2008, p.1127).

An improvement in Information Literacy, Brody claims, could 'perhaps' solve or mitigate the problem. Naiveté suggests a lack of awareness of inadequacy. Information Literacy's ability to develop awareness as expressed in the SCONUL definition ('Identify' in the SCONUL seven pillars (SCONUL 2011)), would imply that naiveté would be addressed, but what of those who already believe they are Information Literate? The key ethical

activities, of listening to peer advice and monitoring the efficacy of one's actions, are required.

Competence or 'fitness to practice' is explicitly described in the Nursing and Midwifery Council (NMC)'s code of professional conduct. Nurses are obliged to '*Provide a high standard of practice and care at all times*' (NMC 2010a, n.p.), to do this they must '*Use the best available evidence.*'

35. You must deliver care based on the best available evidence or best practice

36. You must ensure any advice you give is evidence based if you are suggesting healthcare products or services. (NMC 2010a, n.p.)

Research evidence is key. But knowledge is broader than this and involves information about the patient's cultural background and social circumstances as well as their long term health issues (see Sub-dimension 19: Obtaining sufficient background psycho-socio-cultural background knowledge on a patient. Theme 4: Dimension: *Seeking evidence to integrate into existing knowledge and experience*). The patient is not a scientific experiment but a human being. As shown in the Stage 1 findings, the experience of Information Literacy in this context involves the ability to draw information from many sources: databases, health records, colleagues, patient's family, and the patient themselves (confirming Jacobs et al 2003). This is then critiqued, synthesised and communicated to colleagues as an in depth picture of the patient and their treatment, including the reasons for the choices made. The failure to do so could have consequences ranging from the fatal to an undermining of the patient's comfort and sense of personal

dignity. But again the emphasis is on the nurse's personal (ethical) responsibility to make sure that he or she has these skills.

The Study's Participants, especially those in senior positions, seemed to be certain that Information literacy cannot be written off as something needed for study but with nothing to do with real practice – an attitude still to be found in inexperienced nurses. Nor is it something a nurse, especially one of many years standing, who did their training in the 'pre-IT age', can be excused from developing as something difficult and not sufficiently important for the effort required. Nurses are ethically obliged to be, as several research participants have stated, 'information, and especially research-based information, aware'.

Further Research into the Ethical Parameters of Information Literacy

The absence of any relevant research or widespread discussion of these issues suggests further work is needed to establish the ethical parameters of Information Literacy as it is experienced by practicing professionals.

Research which shows clearly the central role of information literacy in professional activity and the ethical issues which arise from the lack of it is called for. This evidence could support a campaign to prove its key role, get its significance established, and also be used to develop more effective Information Literacy education, with the worthwhile result of a more confident and competent professional.

13.5. A Suggested Modification of the SCONUL Definition of Information Literacy

The findings of this study appear to validate both the emphasis in Section 1.1. on Information Literacy's role in transforming Information into Knowledge, and the relational approach to Information Literacy developed from previous phenomenographic research.

The current SCONUL definition of Information Literacy describes someone who can

'demonstrate an awareness of how they gather, use, manage, synthesise and create information and data in an ethical manner and ... [has] the information skills to do so effectively.' (SCONUL 2011 p.3).

The current study began with a discussion of Information Literacy that highlighted its role in the development of knowledge (and Wisdom).

Knowledge is *true* information, information that has been gathered, critiqued and synthesised and then used to create, as far as can be determined, a truthful representation (Megill 2012; Hoyt et al 2012). The current SCONUL definition does not incorporate this relationship between Knowledge and Information, although the description of the seventh of the seven pillars of Information Literacy ('Present') includes the sentence: *'synthesising new and old information and data to create new knowledge'* (SCONUL 2011, p.11)

Information Literacy in the Nursing profession was shown in this study to be experienced in 6 ways, increasing in complexity from Category of Description A to Category of Description F. As well as in the forms given in Chapter 8, the experience described in each of these Categories can be

expressed in terms of the *active creation of Knowledge and Wisdom* in particular contexts of ever greater complexity. The experiences are, as described in earlier chapters, archetypal ones - individual experiences will involve the specific contextual knowledge implied in each case:

- The passive minimalist. (*creating knowledge to perform specific basic tasks*)
- The knowledgeable goal achiever (*creating knowledge for specific planned goals*)
- The focussed, competent and evolving professional (*creating knowledge to develop professional competence – to function effectively in particular day to day roles*)
- The confident and trusted promoter of justifiable change (*creating knowledge that can be used as an agent of change through an understanding of situations and contexts*)
- The Teacher and Promoter of an evidence-based culture (*developing knowledge infrastructures which allow specific roles to be performed of the kind which must be based on a complete or almost complete understanding of a context or activity*)
- The Leader, Philosopher and Strategist (*developing knowledge infrastructures which allow one to act as an established source or vector of 'wisdom' in various specific contexts*)

With knowledge increasing in complexity as the complexity of Information Literacy experience increases; the latter expressed in the complexity of the use to which the knowledge is put.

Other investigations into Information Literacy experience, such as those analysed in Section 2.2.2. also showed that such experiences imply Knowledge (and Wisdom) development, and in a way which is context or purpose specific. The Categories of Description derived from these studies can be interpreted as experiences which involve the active development of certain knowledge forms of varying complexity in particular contexts.

Lloyd's (2006, p.578) definition of information literacy, based on research into firefighters' information use, as '*coming to know through processes and practices situated within context*' supports this way of looking at Information Literacy experiences. As does Bruce and colleagues' recent concepts of 'Informed Learning', in which Information Literacy and Learning are regarded as almost one in the same (Bruce and Hughes 2010); and 'Informing' information, which, as the product of Information Literacy,

'makes a contribution to something larger—it becomes part of a process that determines action, enables insights, creates a work of art' (Bruce, 2008, p. 101).

That is, becomes an agent of 'wisdom' within distinct contexts and modes of action.

Similarly, the revised Information Literacy definition from ACRL (2015) describes the significance of 'Threshold concepts' - key concepts, the understanding of which allows an individual to progress to a grasp of the fundamentals of a subject or discipline - and the role Information Literacy has in achieving the critical knowledge mass to achieve this. The formal definition itself includes the phrase '*the use of information in creating new knowledge*'.

It could be concluded, then, that Information Literacy could be defined as a process which was contextual, and had knowledge development relevant to that context as its end point or ‘meaning’.

However, evidence for an immediate challenge to this hypothesis seems easy to find. As discussed in Section 2.2.2. Categories of Description from Information Literacy studies seem to be of three types:

1. ‘Process’ categories in which the experience is focused on Information skills and competence.
2. ‘Knowledge’ categories in which the experience is clearly marked as developing knowledge. Knowledge of something, for a particular purpose.
3. ‘Wisdom’ categories, in which knowledge is developed to enable effective decision-making, teaching or similar ‘knowledge-backed’ creative activities.

Less sophisticated, ‘Process’ Categories of Description seem not to support the argument being put forward.

For example, in Bruce’s study (1997). It will be remembered Bruce derived the following 7 Categories of Description describing the Information Literacy experiences of her sample of Australian academics:

1. As a user of IT
2. As knowing what information sources to use
3. Knowing processes to search those sources
4. Information control: having information stored and easily to hand
5. Knowledge construction: building a personal knowledge base
6. Knowledge extension: combining knowledge and personal perspectives

to create new insights

7. Wisdom: using information wisely for the benefit of others: exercising judgement, making decisions, doing research; placing the information in a wider context.

expressing experiences of expanding complexity from 1 to 7, moving from information gathering and management, to knowledge construction (4 and 5) developing knowledge into wisdom (6) and acting as a source of wisdom (7). Although the later Categories in Bruce's study are clearly knowledge or Wisdom based, what of the 'less sophisticated' ones? For example Category 1, where *'the way in which information is used is not a primary concern, rather it is the potential of technology for enhancing information access'* (Bruce 1997, p.118).

Categories 1, 2 and 3 are descriptions of functions or competencies within Information Literacy experience similar to those found in the current study, but in the latter case at the level of Dimensions of Variation rather than as Categories of Description; descriptions of experience of aspects of Information Literacy rather than of Information Literacy per se. For example Category no.3 in Bruce: *'Knowing processes to search those sources'* can be mapped in the current study to the aspect of experience that is Theme 5: *'Information Literacy experienced within application of Skills and Processes of evidence and other information gathering'* in its many different levels of complexity (represented as the sub-dimensions of variation), depending on the complexity of knowledge sought out:

- Negotiating the technology
- Knowing how to use a library/ Library resource website

- Practising time efficient information gathering
- Structuring evidence searches effectively
- Finding all or sufficient evidence
- Critiquing relevant evidence effectively
- Gathering and applying key information within the ward environment
- Gathering evidence effectively for a team, or group project: guideline development or policy change
- Having 'clarity of purpose and action' when gathering evidence

Moving, in stages, from least to more sophisticated experience, with those near the end of the list forming part of the more sophisticated Categories of Description. However all sub-dimensions form part of specifically knowledge-seeking experience that is represented in an archetypal way as a Category of Description. This is supported by Husserl, as described above (Cerbone 2006), for whom a phenomenon must have both meaning (in Information Literacy, as we have seen, this is the knowledge it helps develop) and functional components.

It can be suggested, therefore, that Categories of Description of the less sophisticated 'information gathering activities/knowledge' type found in some studies, should be redefined as Dimensions of Variation: partial experience of Information Literacy, not complete Categories of Description at all.

What are the Implications?

If further Information Literacy phenomenographic studies using the Akerlind method of analysis confirm these conclusions, it suggests that a modification could be made to the SCONUL definition.

By including a 'contextual knowledge focused' implication in the SCONUL definition of Information Literacy it would focus and strengthen it and give it a 'meaning' it could be said to lack for many people. Non information professionals, in the experience of the author of this study, often fail to grasp what Information Literacy is, beyond a generalised description of activities, missing its role in learning and personal and professional development. This has surely limited its acceptance and appreciation. The discussion of the limitations and inadequacies of a behaviourist definition of Information Literacy in Chapters 1 and 2 reinforces this point. An alteration of the definition to make explicit that Information Literacy is always involved in the development of *specific, contextual knowledge* and hence, as Bruce and colleagues have proposed (Bruce and Hughes 2010), part of the learning process, may finally drive home the significance and importance that Information professionals and researchers know it to have.

A revised definition may be of the type:

An Information literate person can

demonstrate an awareness of how they gather, use, manage and synthesise information and data in an ethical manner **in the development of contextual knowledge and understanding** ... and [has] the information skills to do so effectively.

Perhaps nurses would recognise such a definition as a description of what they do more easily than can be said for the current definition. The findings of this study have shown Information Literacy to be central to this profoundly knowledge-based profession.

13.6. Potential Future Projects

How might the findings described and discussed in this thesis be confirmed or further developed?

1. Testing the Evidence-Based Information Literacy Module for Nurses and the Auditing Questionnaire

The model of an evidence-based Information Literacy module sketched out in Chapter 9 should be developed further, with a range of learning activities constructed based on the Themes of Expanding Awareness paired in the manner described. The module should then be piloted and tested for effectiveness, using the auditing questionnaire set out in Chapter 12.

2. Phenomenographic Investigations into other Evidence-Based Professions

The apparently successful use of Phenomenography to analyse Information Literacy and its development in an evidence-based profession such as Nursing, points to the potential value of similar projects in evidence-based, or Information rich, professions such as Law, Midwifery and Social Work. These are professions in which practitioners must be informed by all or sufficient research evidence or other information, and can therefore be seen as demanding Information Literacy in their practitioners for ethical reasons. Such projects could potentially contribute to an increase in Information Literacy's perceived value and significance, by showing in what way it contributes to successful and ethical practice. This would stimulate more widespread and systematic initiatives to develop it, and potentially to greater professional effectiveness and patient/client safety.

3. Further Evidence for the Proposed Alteration to the SCONUL Definition

Additional studies of the experience of Information Literacy could further confirm that context-specific knowledge initiation is always the focus of Information Literacy, and lend further support to the proposed modification of the SCONUL definition. Theoretically these could be of any type, not limited to evidence-based professional groups. The knowledge-intensive nature of such professions would suggest they would provide a strong confirmation. However other quite different groups such as the Unemployed or the Retired may provide better supportive evidence for a change to the general definition by their lack of systematic interest in specific knowledge domains.

4. The future of the 'Information Experience' discipline

Finally, in a recent work, Christine Bruce and colleagues (Bruce et al 2014b) reiterate their desire to see the study of Information Experience become a recognised academic sub-discipline within the discipline of Information Literacy. The author of this study has found so much of interest and value in conducting the current study and from the findings of others in the field that he would like to strenuously support that aim. Hopefully the current study and future potential studies described above will contribute to its eventual fulfilment.

13.7. Summary of the Main Findings and Contributions of the Study

- A description, for the first time, of the range and variations of the experience of Information Literacy in Nursing.
- An outline of an evidence-based Information Literacy educational intervention for nurses
- A new understanding of the ethical necessity to be Information Literate in the evidence-based professions. Previous discussions of ethics and Information Literacy have been restricted to the ethical use of information.
- A new method for analysing Information Literacy development and auditing of Information Literacy educational interventions
- A questionnaire analysing Information Literacy experience; the first of its kind
- Evidence to support the modification of the SCONUL definition of Information Literacy based on an understanding of Information Literacy's 'meaning' as contextual knowledge development.

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Appendix1

Papers Based on This Thesis

Forster, M. (2013) A Phenomenographic investigation into information literacy in nursing practice - preliminary findings and methodological issues. *Nurse Education Today*, 33(10), p.1237-41

Forster, M. (2013) Data analysis issues in a phenomenographic investigation into information literacy in nursing practice. *Nurse Researcher*, 21 (2), p.30-34.

Forster, M. (2013) The Experience of Information Literacy in Nursing Practice. *VISTAS*, 2(1), p.18-28. [Online]. Available at: http://www.uwl.ac.uk/sites/default/files/Departments/Research/Vistas/Web/PDF/VISTAS_2_1.pdf

Forster, M. (2013) Information Literacy as a facilitator of ethical practice in the professions. *Journal of Information Literacy*, 7(1), p. 18-29. [Online]. Available at: <http://ojs.lboro.ac.uk/ojs/index.php/JIL/article/view/1783>

Forster, M. (2015) 6 Ways Of Experiencing Information Literacy In Nursing - The Findings Of A Phenomenographic Study. *Nurse Education Today*, 35(1), p.195–200

Forster, M. (2015) Phenomenography: A methodology for Information Literacy research. *Journal of Librarianship & Information Science*. DOI 10.1177/0961000614566481.

Forster, M. (2015) Refining the Definition of Information Literacy: The Experience of Contextual Knowledge Creation. *Journal of Information Literacy*, [In press].

Appendix 2: Introductory Letter/ E-mail to Potential Participants



Dear

Hello, my name is Marc Forster. I am a librarian at the University of West London who supports nursing courses. I am about to start an investigation into how, when and where nurses find and use information, especially research based information.

I am trying to find this out so that I can help nurses develop the skills they need to do this effectively. As you know, it is so very important to EBP that nurses are able to find and use research effectively.

You have been recommended as someone who may be able to help me. Your knowledge and understanding of the issues involved means that I would very much like to hear what you think on the subject.

Would you be willing to be interviewed by me?

If you agree to take part all that is required is approx. 45 minutes of your time at a location convenient to you.

If you think you may be able to help and would like to discuss the details of the project further, please contact me by telephone or e-mail (details below).

Please be assured that any information you give me will be treated confidentially. You have the right to withdraw from the project at any time.

Thank you!

Marc

Marc Forster
marc.forster@uwl.ac.uk
020 8209 4033

Appendix 3 – NHS Confirmation of Pre-Engagement Checks

NHS to NHS letter of access: proforma confirmation of pre-engagement checks Version 1

For NHS researchers who have a substantive NHS contract of employment or clinical academics with an honorary clinical contract with an NHS organisation, and who need an NHS to NHS letter of access from an NHS organisation hosting their research

CONFIRMATION OF PRE-ENGAGEMENT CHECKS

To: R&D Office

Address of NHS site hosting the research: **The Hillingdon Hospitals
NHS Foundation Trust
Pield Heath Road
Uxbridge
Middlesex
UB8 3NN**

Re: **Marc Forster**

Job title: **Academic Support Librarian**

Contract end-date: **N/A**

Workplace and postal address: **University of West London
Boston Manor Road
Brentford
TW8 9GA**

As the representative of the NHS employer¹ of the above-named person, I can confirm that he is employed by this organisation. I understand that the responsibility for ensuring that the appropriate pre-engagement have been undertaken rests with us as the individual's substantive employer. I can confirm that the appropriate pre-engagement checks have been completed, commensurate with his job description and proposed research role in your NHS organisation, and in line with NHS employment checks standards

Name of employer's representative: **Maria Pennells**

¹ For clinical academics, this would be a representative from their HEI employer

Appendix 4 - The Participants

A brief description of the 41 participants in Stage 1 of the study. Their number identifies the order in which they were interviewed.

Participant 1

Senior Lecturer in Nursing with a background in Critical Care. Teaches an EBP module. The participant has been teaching since 1994. The Interview took place at the Paragon House campus

Participant 2

Senior lecturer in nursing now teaching EBP and research methods for dissertations. Clinically in cardiothoracic nursing – postgraduate courses mostly. The Interview took place at the Paragon House campus

Participant 3

Senior lecturer in Adult Nursing. Course leader for an Overseas Nurses programme. Previous clinical specialism in Trauma and Orthopaedics. The Interview took place at the Paragon House campus

The first three participants took part in the Pilot Study. As the interview protocol was changed only very slightly after the Pilot Study. This suggested these transcripts could be included in the final data.

Participant 4

Nurse Practice Educator with extensive clinical experience. Responsible for supporting the academic and clinical skills training of nurses who specialize in cancer care. The Interview took place in the Trust Library.

Participant 5

Practice educator, working in practice alongside nurses supporting their learning and development in practice; conducting class-based and ward-based teaching sessions. The Interview took place in the Trust Library.

Participant 6

Enhanced recovery nurse – employed to roll out and embed the principles of enhanced recovery within planned care. The Interview took place in the Trust Library.

Participant 7

Practice educator in planned care - mostly surgically based support for ward staff with a small element of formal classroom teaching. The Interview took place in the Trust Library.

Participant 8

A Matron in a surgical department with 17 years clinical experience. The Interview took place in participant's office.

Participant 9

A Clinical Practice Educator for post-registration nurses. The Interview took place in participant's office

Participant 10

Staff Nurse in general adult ward with 8 years clinical experience. The Interview took place in participant's office

Participant 11

Matron in Critical care with 13 years clinical experience. The Interview took place in participant's office

Participant 12

Practice Educator in Planned Care. The Interview took place in participant's office

Participant 13

Clinical Practice Educator in Intensive Care. The Interview took place in participant's office

Participant 14

Senior cancer Research nurse managing research nurses and setting up programmes for them. The Interview took place in participant's office.

Participant 15

Staff Nurse in a Neonatal Clinic with one year's experience since registration. The Interview took place in the Trust library.

Participant 16

Advanced Nurse Practitioner in Asthma whose role involves making sure relevant patients are treated according to the British Thoracic Society guidelines. The Interview took place in an office near the participant's work location.

Participant 17

Trust-wide Nurse Lead for clinical systems. A senior figure in the Trust's Nursing management. The Interview took place in an office near the participant's work location.

Participant 18

Nurse Lead for Dual Diagnosis. Of Australian background with more than 10 years experiences of working in Substance Abuse Nursing in this country. Interviewed while studying at UWL. The Interview took place in the Library at Paragon House.

Participant 19

A community Chlamydia screening co-ordinator and sexual health nurse with wide experience of providing services to young people. Approached while studying at UWL. The Interview took place in an office near the participant's work location.

Participant 20

Hospital-based HIV and Sexual Health nurse. Approached when studying at UWL. Interviewed in the Library at Paragon House.

Participant 21

Care Home Nurse primarily caring for dementia sufferers. Of African background and training with only a short time working in the UK.

Approached when studying at UWL. Interviewed in the Library at Paragon House.

Participant 22

Sister in a Chest and Allergy clinic. Approached when studying at UWL for a post-registration qualification in Infection Control. Interviewed in the Library at Paragon House.

Participant 23

Staff Nurse on a Gynaecology ward. Approached when studying at UWL. Interviewed in the Library at Paragon House.

Participant 24

Team Leader - School nursing. Of Irish background with many years' experience in the UK. Approached when studying at UWL. Interviewed in the Library at Paragon House.

Participant 25

Sister Haemodialysis unit. Of Indian background and training with 7 years UK experience. Approached when studying at UWL. Interviewed in the Library at Paragon House.

Participant 26

Cancer nurse with a strategic role setting strategy and direction for Cancer nursing throughout the trust. Interviewed by telephone.

Participant 27

Community Matron advanced practitioner in the community looking after patients with long term conditions. The Interview took place in an office in the Reading campus

Participant 28

Charge Nurse on the Acute Medical Ward. Previously acting Matron for three other wards; Senior Staff Nurse on an Oncology Haematology Ward. The Interview took place in an office in the Reading campus

Participant 29

Sister in a mixed adult general intensive care unit, with some high dependency patients. The Interview took place in an office in the Reading campus

Participant 30

Clinical Placement Facilitator, Preceptorship Lead and also practicing in the intensive care unit. Interviewed in the Library in my office.

Participant 31

Ward Manager in Special Ward, an acute medical unit receiving patients from A&E directly. Previously a clinical sister. Interviewed in the Library at Paragon House

Participant 32

School Community Staff Health Nurse working with children from five to 18 years of age. The Interview took place in an office near the participant's work location.

Participant 33

Tutor in Mental Health Nursing courses with a number of years' experience as a nurse on Mental Health wards. The interview was conducted at UWL.

Participant 34

Academic course leader for Learning Disabilities programmes and teacher on Public Health courses with extensive experience as a Learning Disabilities nurse. The interview was conducted in my office

Participant 35

Senior academic in Mental Health Nursing with extensive experience managing Mental Health Nursing services and working on the ward. The interview was conducted in my office

Participant 36

Paediatric Research nurse based in a Neonatal Unit. The Interview took place in an office near the participant's work location.

Participant 37

Senior staff nurse in Paediatrics specialising in high dependency, previously a neonatal nurse, and a paediatric critical care nurse. The interview was conducted by telephone.

Participant 38

Programme leader for Mental Health Nursing courses with a number of years' experience as a nurse on Mental Health wards. The interview was conducted in the author of the study's office

Participant 39

Practice educator in the Children Services department of a local hospital. Previously Senior Staff Nurse on an ambulance care unit and staff nurse in general paediatrics concentrating on children with special needs. The interview was conducted by telephone.

Participant 40

A community Nurse with a local Learning Disability Team with 3 years' experience. The interview was conducted by telephone.

Participant 41

A newly appointed lecturer (from practice) in Adult Nursing who had been advised to take the SEARCH information literacy module as an aspect of professional development.

Appendix 5 - The Final Interview Protocol

Can you tell me what your current job is?

What does EBP mean to you? What are its positive effects on Nursing practice; does it have negative effects?

In what way do you promote or are involved in EBP?

How do you use information skills to do this? Do you have any examples?

- *How do you (or the team) get from a clinical problem to an information need?*
- *What are you/their first thoughts?*
- *Do you begin with a plan? If not, why? What is your/their usual sequence of thoughts and activities?*
- *What processes and activities do you/they use?*
- *What are your/their databases / sources of information?*
- *How do you/they appraise what you've done so far?*

What kinds of Information Skills are necessary for EBP?

In what ways does having poor information skills and research awareness have a negative effect on a nurse's practice?

What is your picture of a nurse who uses information effectively?

Can you give other examples of ways you or your team have used research evidence to inform nursing practice

How has EBP affected nurse relationships with other professions; with patients and family members?

Appendix 6 – The SEARCH Module via the University of West London's VLE

Welcome to SEARCH!

Thank you for taking part in this research study!

The screenshot shows the myBlackboard interface for the SEARCH module. The top navigation bar includes the University of West London logo, the text 'myBlackboard', and links for 'Home Page', 'Courses' (highlighted), 'Communities', and 'UWL Library'. A 'Help for students' link is also present. The left sidebar contains a 'Course Management' section with a 'Control Panel' and various links like 'Content Collection', 'Course Tools', 'Evaluation', 'Grade Centre', 'Users and Groups', 'Customisation', 'Packages and Utilities', and 'Help'. Below this is a 'Quick Unenrol' button. The main content area features a 'Search' graphic and the text 'SEARCH for Health (@ University of West London - all rights reserved)'. It instructs users to complete units in sequence by clicking on links below and to click on 'Unit Resources' in the main menu for links to web sites and on-line search guides. A list of units is displayed, each preceded by a folder icon: 'Introduction to SEARCH for Health', 'Unit 1 - Why Finding and Using the Right Information is Important in Health and Social Care', 'Unit 2 - Types of Information Source and Their Value', 'Unit 3 - Identifying Relevant Information', 'Unit 4 - Locating Information', 'Unit 5 - Appraising Your Results and Re-evaluating Your Search Strategies', and 'Unit 6 - Referencing Using the Harvard System'.

The module involves reading and studying the learning material on Blackboard.

Read through the Introduction and then the 6 Units (under 'Module Units' to the left in the menu) in sequence. Each Unit has a number of sections.

The Units consists of texts to be read. The idea is to read through the Units and absorb the ideas and information discussed. Each Unit contains discussions of significant material which you need to know and understand in that area; e.g. 'the types of information

source a nurse needs to know about' (Unit 2). So make notes, and do the Activities as they come along if you wish. The activities help you understand what you've been reading about.

1. Make notes as you go along.

2. In some sections you will reach a page which asks you to do an 'activity' based on what you've been reading. You will be asked to either **answer a few simple questions** or publish an opinion or search result onto the **Discussion Board**.

The purpose of these activities is to help you understand more fully what you've been reading about. Please do them if you wish although you're not obliged to.

Attach your answers from the 'question'-type activities to e-mails to send to Marc.

if you have any questions or problems get in touch with Marc.

Appendix 7– Structural Details of the SEARCH Module

Unit 1 - Why Finding and Using the Right Information is Important in Health and Social Care

Section 1 - It's Important to be Information Literate

Section 2 - What are the Main Practical Reasons why Being Information Literate is Essential for Health Professionals?

Section 3 - Information Literacy Skills for Academic Study

Section 4 - Some Limitations of Common Sources of Information

Unit 2 - Types of Information Source and Their Value

Section 1 - Monographs and Edited Texts

Section 2 - The Journal Literature: research studies of various kinds, reviews, anecdote and opinion

Section 3 - Other Sources of Information: systematic reviews, theses, reports, guidelines, statistics, Legislation

Unit 3 - Identifying Relevant Information

Section 1 - Finding Books on Your Topic

Section 2 - Journal Reference Databases

Section 3 - Searching Journal Reference Databases: Key Concepts

Section 4 - Searching the CINAHL Database and other EBSCO Databases Effectively

Section 5 - Searching the Medline Database and other OVID Databases Effectively

Section 6 - Searching Other Databases and Websites for Relevant Reports, Guidelines and Systematic Reviews

Unit 4 - Locating Information

Section 1 - Libraries: Their Layout and Functionality; Using the Catalogue

Section 2 - Online Journal Articles (e-Journals)

Section 3 - Other Websites as Sources of Documents, Statistics or Other Information

Section 4 - Local Sources/'Unpublished' Material

Unit 5 - Appraising Your Results and Re-evaluating Your Search

Strategies

Section 1 - The Appraisal of Your Search Results

Section 2 - Re-evaluating Your Search Strategies

Unit 6 - Referencing Using the Harvard System. Using the RefWorks

Referencing Software.

Section 1 - Referencing

Section 2 - RefWorks

Appendix 8– Formative Assessment from the SEARCH Module

(example)

Activity 2.1

Where to Go?

Select appropriate information sources from the list which would allow you to answer the questions and problems below. You can select more than one if you wish.

Textbook; Research Study; Clinical Guideline; Systematic Review; Integrated Care Pathway

What is the correct treatment for a patient with heart disease?

Describe 'Gibbs's Reflective Cycle'

A multidisciplinary team needs a care plan for a cancer patient

Is aspirin effective in reducing blood pressure?

What specialist care is appropriate for people in the first 2 weeks after a stroke?

Explain your choice(s) for each of the above (maximum 3 lines of text each) in the appropriate **Discussion Board thread**.

Read the postings from all the other members of the group.